MONTHLY INTERNATIONAL FEATURE ISSUE

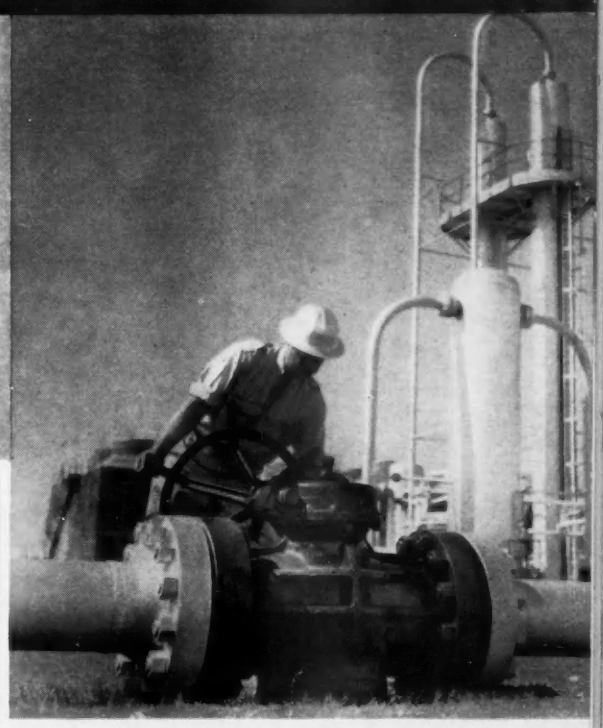
INDEX PAGE 5

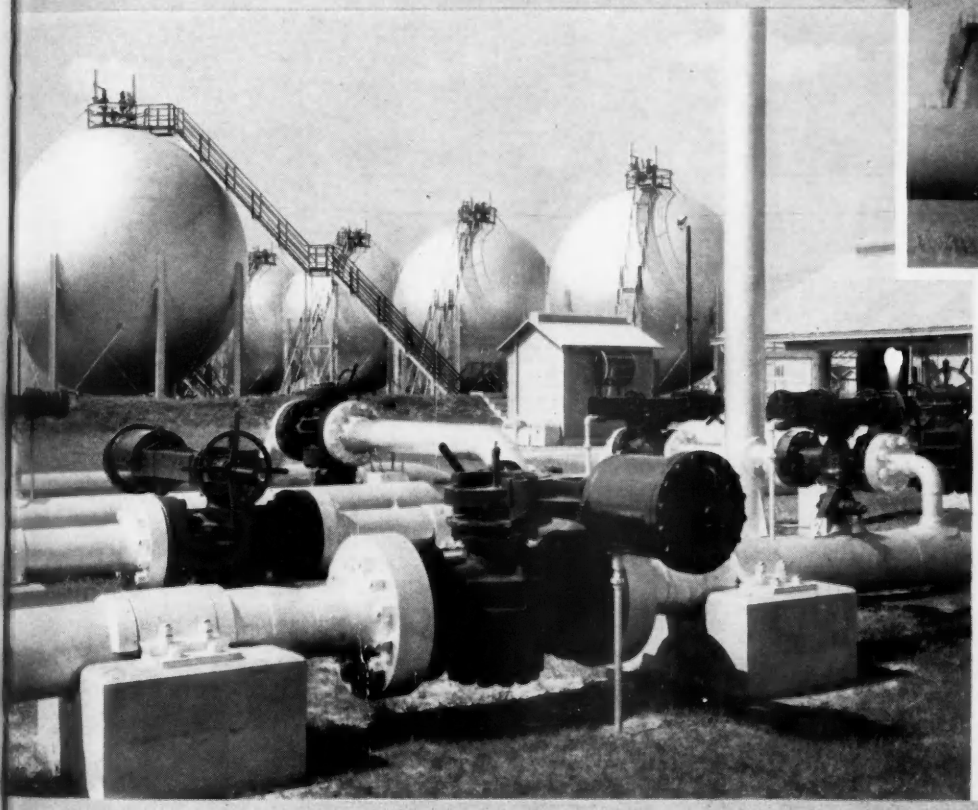
The OIL WEEKLY

FOR THE DRILLING, PRODUCING, PIPE LINE INDUSTRY

Cycle WITH NORDSTROMS

KEEP UPKEEP DOWN





ABOVE: Nordstrom Valve on high pressure gas line in Katy Cycling Plant, Texas. AT LEFT: Nordstrom Cylinder-Operated Hypreseal Valves in the same plant.

Cycling—the "big move" in conservation of gas, sponsored by forward-looking operators, has saved billions of feet of gas and added immeasurably to the productive life of oil and gas fields. From the inception of the cycling movement, years ago, Nordstrom engineers have given special attention to the valve needs for cycling. In virtually every cycling operation, Nordstrom Valves are standard equipment.

NORDSTROM VALVE DIVISION
Rockwell Manufacturing Company
Main Offices: 400 N. Lexington Avenue, Pittsburgh 8, Pa.

Atlanta, Boston, Chicago, New York, Pittsburgh

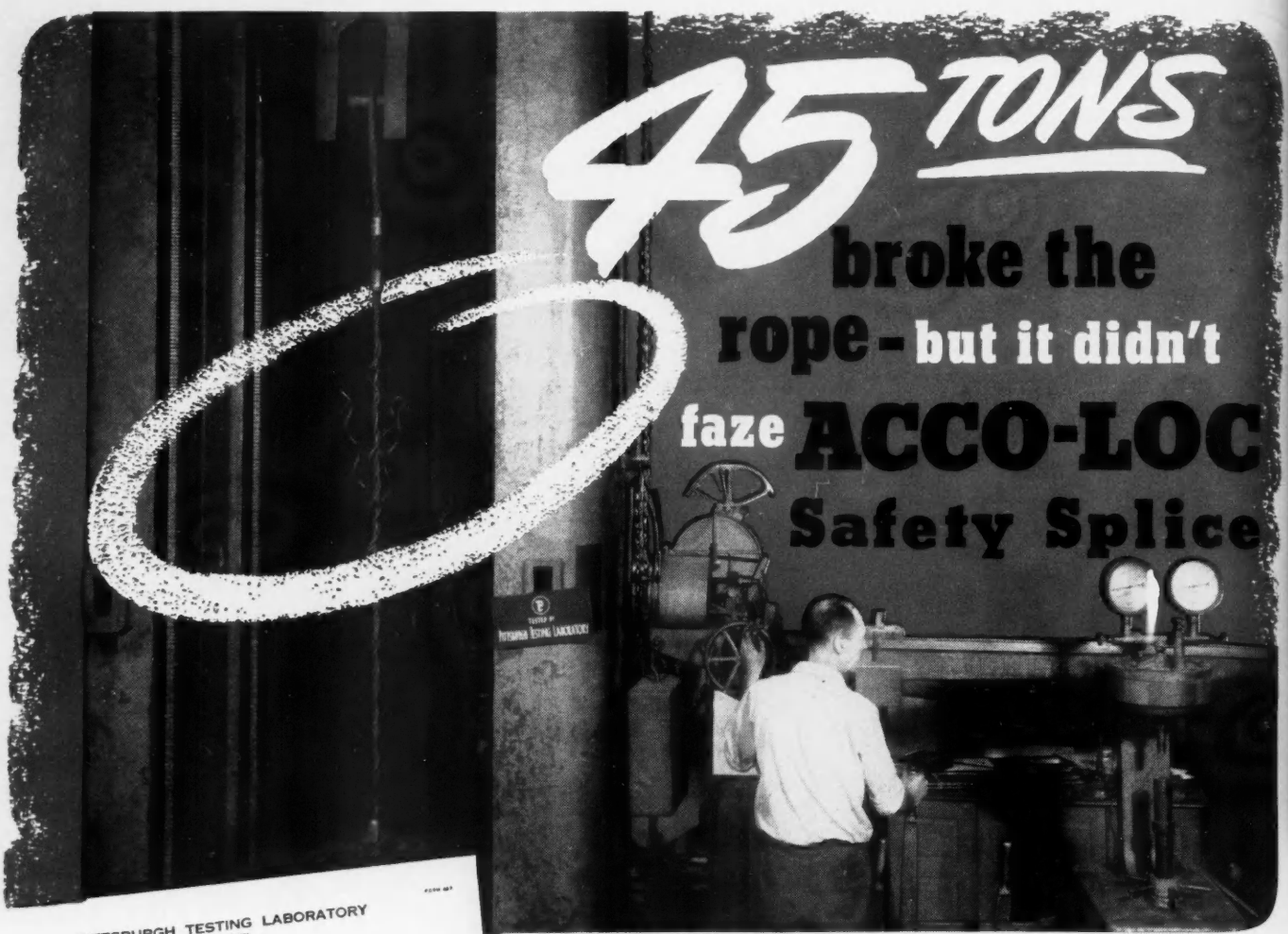
ROCKWELL NORDSTROM

Houston, Kansas City, Los Angeles, San Francisco, Seattle, Tulsa

Nordstrom
LUBRICATED VALVES

October 7, 1946

45 TONS broke the rope - but it didn't faze ACCO-LOC Safety Splice



PITTSBURGH TESTING LABORATORY

PITTSBURGH, PA.

LABORATORY No. 363283

FILE No. 11209.19

JR No. PH-796

MFG No.

REPORT

July 14, 1945

Tensile test of - Wire rope assemblies made of 6x19 PREFORMED Improved Plow Steel Wire Rope with Independent Wire Rope Center with ACCO-LOC SAFETY SPLICE Loop on each end.

Reported to - American Chain & Cable Co., Inc.
Wilkes-Barre, Pa.

TEST NO.	ROPE DIAMETER	ACTUAL BREAKING STRENGTH	MINIMUM REQUIRED BREAKING STRENGTH	TYPE OF FRACTURE
1	3/8"	14,680#	12,800#	4 strands & center
2	3/8"	14,680#	12,800#	6 strands & center
3	3/8"	14,660#	12,800#	5 strands & center
4	1/2"	26,010#	22,400#	4 strands & center
5	1/2"	25,850#	22,400#	4 strands & center
6	1/2"	26,050#	22,400#	4 strands & center
7	3/4"	51,250#	49,900#	3 strands & center
8	3/4"	50,900#	49,900#	4 strands & center
9	3/4"	51,750#	49,900#	3 strands
10	1"	91,000#	87,600#	4 strands & center
11	1"	94,550#	87,600#	3 strands & center
12	1"	95,050#	87,600#	3 strands & center

RESULTS:
1. All specimens exceeded the minimum required breaking strength.
2. After testing, all ACCO-LOC SAFETY SPLICES were intact. None showed visible deformation.

NOTES:
1. All minimum breaking strengths from Federal Specification NN-R-571a for Wire Rope, dated May 6, 1945. Reference Table XXVI for 3/8" dia. rope, plus 7-1/2% for INRC. Reference Table XXVIa for 1/2", 7/8" and 1" dia. wire ropes.
2. For tests 1 to 9 and 12 inclusive speed of testing machine 1-1/16" per minute.
3. For tests 10 and 11 speed of testing machine 7/16" per minute.

PITTSBURGH TESTING LABORATORY
R. B. Lincoln
Physical Test Section

$\frac{3}{8}$" to 1" TRU-LAY Preformed wire ropes, equipped with ACCO-LOC Safety Splices, pulled to destruction — without the slightest effect on the rope terminals. That test was made by the Pittsburgh Testing Laboratories. But it is in the thousands of plants where ACCO-LOC Safety Splices are daily proving their 100% efficiency that the test of true worth is appreciated. — Compact, neat, flexible, made without distortion of rope structure, the ACCO-LOC Safety Splice is a revolutionary advance for wire rope endings. Send today for fully detailed literature.

Distributors in all strategic points

ACCO Wilkes-Barre, Pa., Chicago, Denver, Emlenton, Pa., Houston, Los Angeles, Pittsburgh, San Francisco, Bridgeport, Conn.

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

EXPERIENCE BUILDING OIL TOOLS SINCE 1882

There is a NORRIS Tubular Product for *your* job

★ NORRISIZED
Swaged Nipples & Bull Plugs

Forged Steel Seamless Welding Reducers
Also available in wrought iron.

NIPPLES — Tubing, Casing, Adaptor
Perforated Pipe Nipples

★ NORRISIZED
Boiler Nipples, Open Flow Nipples, Choke Nipples

Segmentally Welded Pipe Fittings
steel or wrought iron
Grooved — Beveled — Plain End

★ NORRISIZED
Seamless Steel Substitute Collars
for reducing tubing or pipe

Forged Steel Seamless Casing, Tubing and Line Pipe Couplings

QUALITY MAKES FRIENDS

★ **NORRISIZED FINISHED**

W. C. NORRIS pioneered and introduced the exclusive NORRISIZING treatment that eliminates rust and corrosion. Prevents galling and seizing of threads, giving you products that remain bright and new throughout their useful life. To be sure of NORRISIZED Finish, insist on only the genuine W. C. NORRIS — look for the label.

For over half a century, W. C. NORRIS and QUALITY have been synonymous in oil tools. Like the long famous NORRIS Swaged Nipples and Bull Plugs — used round the world, NORRIS Tubular Products through quality and dependability on the job have won for themselves the highest endorsement of Petroleum Engineers, Superintendents and Production Men of long experience.

Send for BULLETIN NO. 31-A

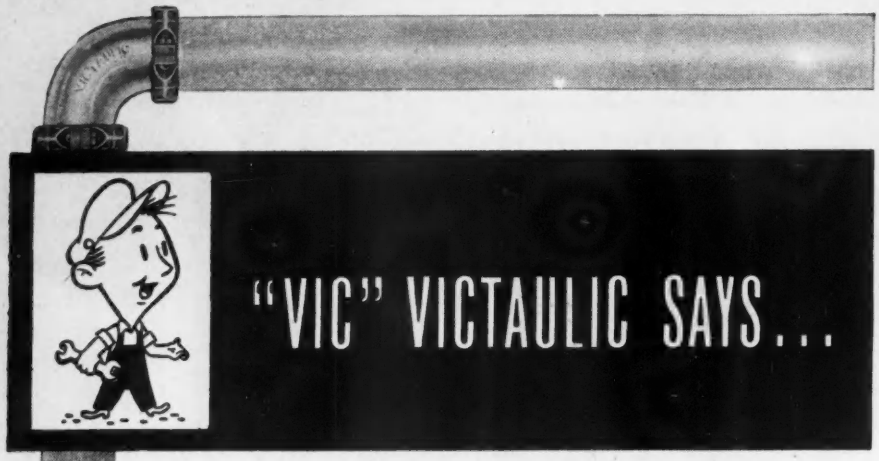
W. C. NORRIS MANUFACTURER, INC.

TULSA, OKLAHOMA

BRANCHES
HOUSTON, KILGORE, ODESSA, TEXAS. SALEM, ILLINOIS
801 CONTINENTAL BUILDING, DALLAS, TEXAS

ARMY E NAVY
QUALITY MAKES FRIENDS

EXPORT OFFICE
ROOM 1940, 30 ROCKEFELLER PLAZA
NEW YORK CITY



"VIC" VICTAULIC SAYS...

"A coupling's gotta let your pipeline give and take!"

"...and Victaulic Couplings do. They allow for expansion and contraction caused by temperature changes. They automatically relieve pipeline stresses.

"Special expansion joints aren't necessary in a Victaulic line... because the Victaulic Coupling floats in the pipe end grooves. There is clearance on either side of the housing and yet a leak-tight, positive, slip-proof lock at every joint!

"And this same feature offers a *flexible* coupling... allowing your pipeline to follow the contour and curves with a minimum of fittings—eliminates the need for accurate alignment.

"For an economical, efficient and dependable piping system, use Victaulic Couplings and Victaulic Full-Flow Fittings."

Write for new Victaulic Catalog and Engineering Manual

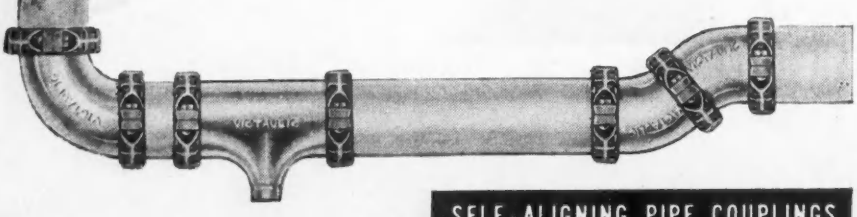
VICTAULIC COMPANY OF AMERICA

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Victaulic, Inc., 727 W. 7th St., Los Angeles 14, Calif.

Victaulic Company of Canada, Ltd., 200 Bay St., Toronto

For export outside U. S. and Canada: PIPECO Couplings and Fittings: Pipe Couplings, Inc., 30 Rockefeller Plaza, New York 20, N. Y.



Have you considered Victaulic for your piping requirements?

Sizes—¾" through 60"

SELF-ALIGNING PIPE COUPLINGS

VICTAULIC

EFFICIENT FULL-FLOW FITTINGS

Copyright 1946, by Victaulic Co. of America

Looking Ahead

WITH THE EDITOR

SINCE the devastation of Hiroshima and Nagasaki by the highly-secretive atomic bomb, there has been much speculation on the new era in which man finds himself. What is this monstrous power that can level a city in one cataclysmic blow? How can such a force be controlled to benefit mankind? These and other questions have been asked over and over in one form or another for more than a year. In the laboratories of the world, scientists are attempting to learn more about this phenomenon in order that it may be put to constructive work.

According to men who realize what this new source of energy means, every phase of human life will be affected. Power sources as we know them today will in years to come be obsolescent in the competitive light of atomic power. While man has opened a great secret long held in bondage by the earth, ways and means to harness this power in some practical form is yet to be heralded by industry. However, those with vision of this new horizon anticipate great achievements in all branches of production.

Nuclear reactions will affect the oil industry in several forms. "By-products" of chain reactions may be found in the gamma ray, a form of radiation useful in logging wells and making determinations of wall thickness in metal vessels. Radiation also affects the formation of certain hydrocarbon substances. Possibilities and limitations of this new source of power as it pertains to oil is the scope of "Influence of Atomic Science on Petroleum," by R. E. Fearon, consultant for Well Surveys, Inc., to appear in the October 14 issue of THE OIL WEEKLY.

THE OIL WEEKLY, published every Monday. Entered as second class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

Specialized Oil Publications of
THE GULF PUBLISHING COMPANY
Box 2608, Houston (1), Texas

The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipe line industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

Member Audit Bureau of Circulation and Associated Business Papers, Inc.

EDITORIAL STAFF

WARREN L. BAKER, *Editor*
SILAS B. RAGSDALE, *Managing Editor*
L. J. LOGAN, *Associate Editor*

DISTRICT EDITORS

Washington: Albee Bldg. (5)
BERTRAM F. LINZ

Fort Worth: W. T. Waggoner Bldg. (2)
H. H. KING

New York: 250 Park Ave. (17)
GEORGE O. IVES — HENRY OZANNE

Tulsa: Hunt Bldg.
ANTHONY GIBBON — WILLIAM P. STERNE

Los Angeles: W. W. Wilson Bldg., Huntington Park
GILBERT M. WILSON

Austin: Drawer M., Capitol Station (21)
R. W. BYRAM

Houston: 3301 Buffalo Drive
JAMES S. CRITZ — AL REESE
WELDON B. HILL — J. E. KASTROP
CECIL W. SMITH — C. CLYDE PRYOR

ADVERTISING STAFF

TOM W. NELSON, *Advertising Manager*

New York: 250 Park Ave. (17)
DICK SWINSKY — ROBERT N. CAIRD, JR.
NELSON BIGELOW

Cleveland: 1010 Euclid Ave. (15)
ROGER MOTHERAL

Chicago: 332 S. Michigan Ave. (4)
H. G. FITZPATRICK

Tulsa: Hunt Bldg. (3)
J. F. CARTER, JR.

Los Angeles: W. W. Wilson Bldg., Huntington Park
J. W. CURTS

Houston: 3301 Buffalo Drive (6)
CHARLES WYATT — BILL ATCHESON

CIRCULATION DEPARTMENT

J. HOWARD DONAHUE, *Manager*

Published every Monday. Single copies 25 cents (except special issues). Subscription price: domestic and foreign, $2.00 a year; 2 years, $3.00; 3 years, $4.00. Advertising rates on application. Copyright 1946 by The Gulf Publishing Company.

The OIL WEEKLY

ENGINEERING NEWS STATISTICS

R. L. DUDLEY, President, Publisher A. L. BURNS, General Manager

Contents — OCTOBER 7, 1946

VOLUME 123, No. 6

Technical and Feature Articles

HARD ROCK ROTARY DRILLING 17
By Floyd L. Scott

FUNDAMENTALS OF INDUSTRIAL ACCIDENT PREVENTION, PART 10 22
By C. L. Hightower

CONSERVATION PAYMENT FOR STRIPPERS 26

COOPERATIVE SALT WATER DISPOSAL SYSTEM SERVES ERATH OPERATORS 28

SODIUM CHROMATE AS A CORROSION INHIBITOR IN GAS-CONDENSATE WELLS, PART 2 (CONCLUSION) 30
By C. K. Eilerts, H. A. Carlson, R. V. Smith, F. G. Archer and V. L. Barr

DRILLING COSTS UP SHARPLY ABOVE PREWAR 37
By David I. Siskind

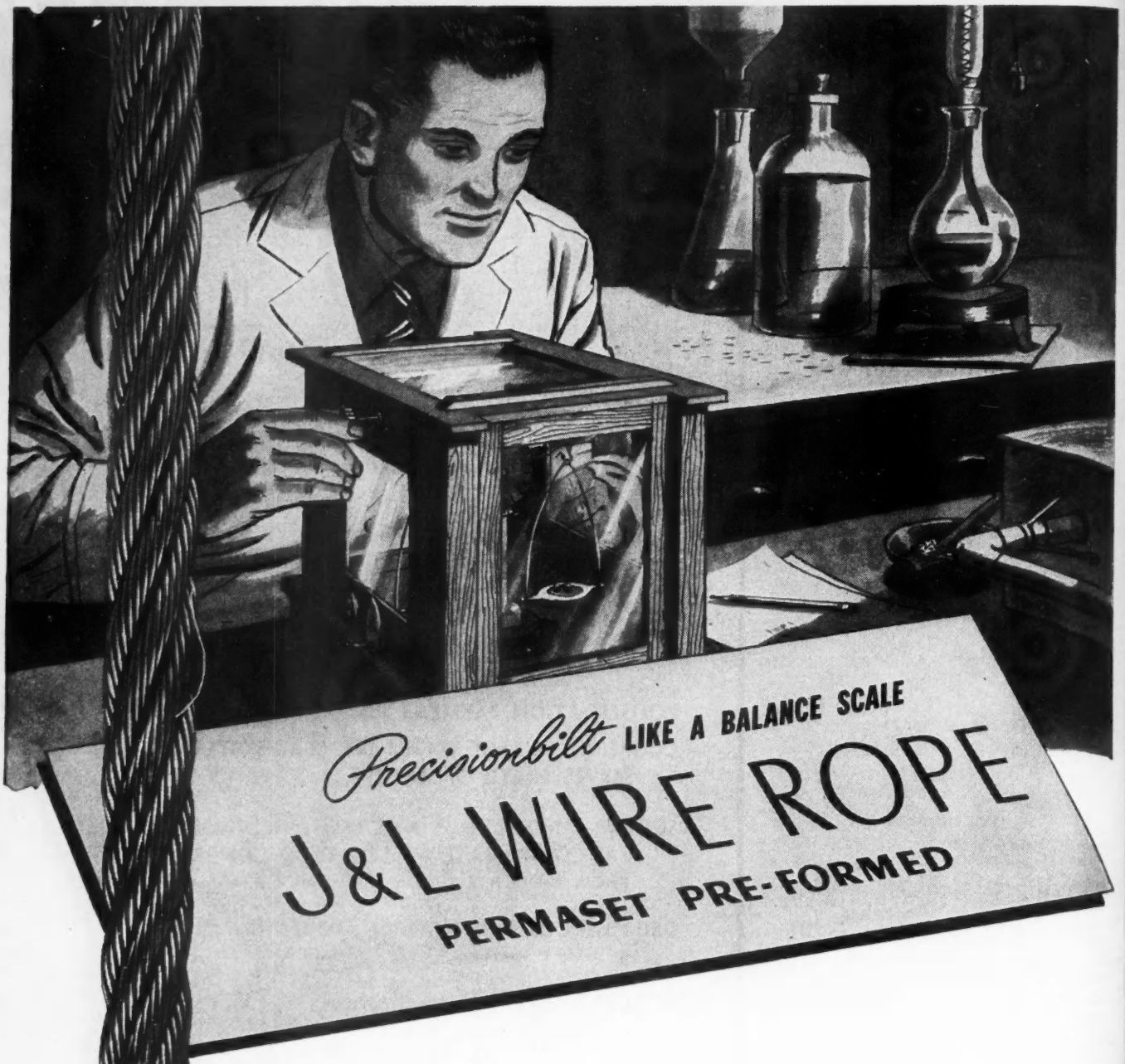
DRILLING HINTS 42

Monthly International Feature Section

INSERT 48-49

News and Departments

LOOKING AHEAD 2
THE OUTLOOK 7
THE CHANGING PANORAMA 9
THE WEEK'S NEWS 10
CRUDE PRODUCTION 13
PIPE LINE NEWS 14
OIL WELL DRILLING CONTRACTOS' CONVENTION 15
NEW EQUIPMENT, LITERATURE 49
MARKET TRENDS 55
FIELD OPERATIONS 57
EXPLORATORY COMPLETIONS 70
WILDCAT STARTS 72
SQUEAKS FROM THE BULL WHEEL 76
MEN IN THE INDUSTRY NEWS 77
MANUFACTURERS' NOTES 79
ADVERTISERS' INDEX 80



Precisionbilt, like a balance scale, J&L Permaset Pre-formed Wire Rope is designed for balance and built for quality by men of experience and skill.

J&L Precisionbilt Permaset Pre-formed Wire Rope is made of J&L Controlled Quality steel—it has the strength and stamina for the toughest jobs.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

THE OUTLOOK

WAA, which currently has 45,000 employes, thinks the force is insufficient to move surplus property and several thousand more will be engaged soon. Peak is expected early in 1947.

* * * *

A definite trend toward use of larger diameter pipe and wider spacing of pump stations is indicated in new construction of pipe lines. Officials point out that such construction affords more economical operations.

* * * *

Movement of petroleum products by pipe line from Texas Gulf Coast refineries to inland terminals is expected to take on major proportions when all pipe line construction plans are completed. At present, one such carrier is in operation, a second has been announced, and right-of-way has been signed for a third. A fourth, not yet announced, is planned from Houston through Texarkana to a terminal on the Mississippi River, possibly near Memphis, Tenn.

* * * *

Some quarters are worried lest oil workers lead the next big national strike wave with a demand, among other things, for a welfare fund. Increased hourly wage scales, of course, would be included.

* * * *

Threat of Jewish extremists to sabotage American oil facilities in the Middle East is designed to turn the heat on in the United States for reversal of the Anglo-American policy on Palestine. First point of attack, it was indicated by the Jewish underground radio, would be the pipe lines.

* * * *

Despite reports to the contrary, the Civilian Production Administration will not go out of business before next summer. Administrator John D. Small's efforts quietly to skeletonize the CPA have been halted by Stabilization Director John Steelman, who has ordered controls over lead, crude rubber and other items continued.

* * * *

A broad-scale ship scrapping program may be necessary to solve the steel industry's scrap problem. Shipbreakers currently are contributing about 15,000 tons of scrap a month, but will reach 40,000 tons monthly before the end of the year. More than a million tons of scrap could be had from obsolete and damaged ships already condemned, and another three million tons if the 1000 excess Liberty vessels are scrapped.

* * * *

First decision as to the disposal of the Big Inch pipe lines may be announced within the next two or three weeks, in the shape of recommendations by the real property disposal board of WAA. The board's recommendations, however, will be subject to review by superior boards and the final decision of the administrator, of course, will be reviewed by the Department of Justice.

* * * *

Although the current economic situation is highly favorable, the administration is laying definite plans for quick action if continued price increases, declines in the stock market or psychological factors cause consumer or business spending to falter. Immediate resumption of public works construction would be the most important step in such a plan, to be buttressed by readjustment of taxes and other fiscal policies and a crack-down on monopolistic practices blocking reduction of prices.

* * * *

More and more activities of the American Petroleum Institute are expected to be centralized in Washington as time goes on, in recognition of the importance of the government's constantly increasing influence in matters of primary concern to trade associations.

* * * *

Tax reductions are coming, mayhap as much as 10 percent in personal income excises for next year. New tax laws by the next Congress are likely with Republicans wanting to make the changes effective in 1947 and Democrats, eyes glued to a presidential election year, apparently favoring 1948.

Tank Owners throughout the oil fields have proven for themselves, by actual experience in their own tanks, that "Natasco" Products will definitely solve **Corrosion** and **Leaky Tank** problems.

Regardless of size, or whether you plan on New or Re-Built tankage, "Natasco" Insulation at the time of erection will extend the life of the tank indefinitely.

If you plan to clean-out and repair old tankage, give serious thought to the advantages of "Natasco" Insulation and Seal. Many old tanks, even in severe **"Sour-Oil"** districts, are giving perfect service today because of the foresight of their owners in using "Natasco" Protection.

We will gladly furnish any tank owner with complete information about "Natasco" Products and their uses for . . .

Insulating Inside Surfaces to Prevent Corrosion
Sealing Old Tank Bottoms to Prevent Leakage
Sealing Tank Tops Vapor-Tight
Minimizing Fire Hazard

WRITE **WIRE** **TELEPHONE**

"NATASCO"
CONSERVES Oil and Equipment

TANK SEAL PRODUCTS COMPANY

Post Office Box 617-W **Tulsa 7, Oklahoma** **Telephone 2-4149**

THE CHANGING Panorama

Confident of Oil Supply

THE oil industry outlook as viewed by the head of the largest domestic oil producing company of the United States contrasts greatly and very favorably with the prospects as pictured recently by several high government officials. Harry C. Wiess, president of Humble Oil & Refining Company, foresees further progress and expansion and a continued vigorous industry, resourceful enough to guarantee adequate supplies of oil from domestic sources, regardless of demand volume. The government men talked of the necessity of importing half our oil needs in 20 years. But the oil industry, as represented by Wiess, thinks differently.

Discussing present and prospective petroleum developments before a group of newspaper and magazine writers, Wiess declared that "Government interference designed to hoard oil for future emergencies would be a serious threat and a great handicap to the availability of adequate supplies of liquid fuels for national security. The inadequacy of naval reserves was demonstrated during World War II. The only reserves that are useful in case of an emergency are those already developed and in use. The best assurance of adequate supplies for an emergency is the normal operation of a healthy industry engaged in meeting large demands regularly. The oil industry has demonstrated consistently that, without government control and direction, it can meet fully all essential demands in war as well as in peace."

Wiess' summary of the facts:

1. Present and prospective reserves of crude oil, condensate, and natural gas will provide substantial quantities of fuels far into the future. Geologists are confident of important new discoveries not only in present producing states and areas but also in others such as the Southeastern States, Rocky Mountains, and the Continental Shelf. Any decline in production could develop only gradually over a period of years, affording ample time to deal with the problem.

2. New technological development makes possible large supplies of gasoline to be made synthetically from natural gas. Already in the commercial stage, several plants using the processes are under construction or planned. The process is rated as important as cracking, which made possible much greater yields of gasoline from crude oil. This technological development alone is equivalent to increasing oil reserves very greatly. For the known natural gas reserves are equal in weight and fuel value to the known crude oil reserves. Conversion of gas reserves into liquid fuels thus becomes only a matter of economics and time. Higher potential value on natural gas also has resulted.

3. Oil has been available to Americans at remarkably low prices, causing annual consumption of 500 gallons per capita, or 6 times the average for the United Kingdom, 10 times as much as Russia, and 25 times the world average. If tightening supply tended to make oils more expensive, there would be technical improvements and economies in use of oil, gasoline and natural gas.

These three considerations, coupled with free operation of price under competitive conditions, will assure supply equaling demand, Wiess added. Lagging of production would cause higher prices, which would stimulate exploration and discoveries, promote development of synthetic substitutes, and encourage efficiencies and economies in use.

If necessary, he stated, known processes for making liquid fuels from coal will be commercially developed, thereby providing yet another vast source of liquid fuels. Atomic energy also is an ultimate possibility.

Time to Give The Engineer a Chance

THE development of the atomic bomb and the problem of atomic energy control have led in the past year to new relationships between technology and politics. The creation of the Federation of American Scientists, comprising in addition to atomic scientists large groups of radar, jet and rocket scientists, and scientists not particularly concerned with military discoveries, indicate a new interest on the part of the engineer and scientists in social and political problems. It should not have required an atomic bomb to direct attention to the political importance of science and engineering. Two other groups, the Federation of Atomic Scientists and the Association of Oak Ridge Scientists, have announced programs of public and congressional education on atomic education. The motives behind their interest in social and political problems so far are clearly altruistic, and the Federation of Atomic Scientists have emphasized that matters dealing with the economic status, personal and intellectual importance of the technologist are not properly discussed in public announcements.

John Mills' book, *The Engineer in Society,* describes the average scientist as "modest, idealistic, less interested in salary than the nature of his work, politically naive, fundamentally democratic, interested but relatively undeveloped in the liberal arts, reasonably free of prejudices, and unconscious of the forces that mould and guide his destiny." Mills thoroughly approves their awakening, economically, politically, and socially and urges that the scientific point of view should be more universally adopted.

"Perhaps," he says, "the application of the method of science is the last hope of civilization . . . It may be time to give the engineer a chance. But it won't be given him unless he reaches for it."

Events indicate that he is doing so.

The Week's News

DOWNWARD trend in crude demand will be reflected in Bureau of Mines forecast to be issued this week. Texas figure will remain unchanged, Oklahoma dropped. Page 13.

Canol Dead Horse Finale?—Demand from the Senate War Investigating Committee brought about declassification of the Joint Chiefs of Staff Canol file, disclosing that decision to complete the project was reached after plans for air attack on northern Japan from Alaskan bases had been abandoned and Japs cleared out of the Aleutians. Page 11.

Industry Regulation Plan—Plans for the wartime control of industry, laid two years before Pearl Harbor, called for regulation of petroleum and other resources by a single agency are disclosed to have been suppressed because of fears that publication would have brought charges that the administration planned to get into the war. The report was made by a seven-man War Resources Board headed by Edward R. Stettinius, Jr.

Motor Vehicle Registration—Automobile and truck registrations this year will exceed 1945 by approximately 1,900,000, with trucks at an all-time high.

"Mother Hubbard" Suit—The Department of Justice is expected to object to the interrogatories posed by Sun Oil Company in its answer in the "Mother Hubbard" suit, when the deadline for response comes next week. Page 12.

Crude Rubber Price Dropped—Synthetic rubber production has enabled the Reconstruction Finance Corporation to beat down the price of natural rubber to its former level. Story below.

NPC Studying Projects—Membership of three committees to study subjects laid before the National Petroleum Council by OGD Acting Director Ralph K. Davies has been announced by Temporary Chairman Walter S. Hallanan. Story below.

Big Inch Study—The Department of Justice has declined a War Assets Administration invitation to have a representative on an inter-departmental committee which is to discuss disposition of the Big Inch pipe lines. Page 11.

Leasing Regulations—Coordinated views of the industry on leasing law regulations of the Department of Interior discussed at Denver. Page 12.

Groups Named to Study Oil Problems Submitted to New Council by Davies

Members of the committees which will study the problems submitted at the September 26 meeting of the National Petroleum Council by Acting Director Ralph K. Davies of the Oil and Gas Division were named last week by Temporary Chairman Walter S. Hallanan.

The three committees will take up the subjects on which the agenda committee has reported. Three other problems submitted by Davies are being considered.

That committee to inquire into the shortage of pressure tank cars for the transportation of liquefied petroleum gases will be headed by Charles R. Musgrave, Phillips Petroleum Company, Bartlesville, Okla., with the following members: Paul J. Bond, The Pure Oil Company, Chicago; H. E. Coyl, General American Transportation Corporation, Chicago; C. F. Dowd, Tide Water Associated Oil Company, New York; B. C. Graves, Union Tank Car Company, Chicago; Charles S. Jones, Richfield Oil Corporation, Los Angeles; J. R. Parten, Woodley Petroleum Company, Houston, and W. K. Warren, Warren Petroleum Company, Tulsa.

A materials committee which will go into the acute shortage of materials needed by the oil and natural gas industries, particularly those containing steel, lead and other metals, consists of Claude P. Parsons, Hughes Tool Company, Houston, chairman; William W. Beck, General Petroleum Company, Los Angeles; Frank L. Brinegar, Continental Supply Company, Dallas; Bruce K. Brown, Standard Oil Company (Indiana), Chicago; John Guoines, Magnolia Petroleum Company, Dallas; Harold Howard, Howard Supply Company, Los Angeles; Reese H. Taylor, Union Oil Company of California, Los Angeles; Fred Manning, Fred Manning Company, Denver; and William T. Payne, president of the American Association of Oil Well Drilling Contractors, Oklahoma City.

The third committee to study the proposed regulations of the Interior Department under the Mineral Leasing Law as amended, comprises W. H. Ferguson, Continental Oil Company, Denver, chairman; H. H. Healy, Ohio Oil Company, Casper, Wyo.; A. C. Mattei, Honolulu Oil Corporation, San Francisco; Gilbert J. Mueller, Argo Oil Corporation, Denver; M. H. Robineau, Frontier Refining Company, Cheyenne, Wyo., and R. S. Shannon, Pioneer Oil Corporation, Denver.

The three proposals not yet acted upon call for the assembly, compilation and analysis of petroleum statistics on a world-wide basis, as recommended before its dissolution by PIWC; a program of statistical work relating to the future availability of fuels for military aircraft, requested by the Army Air Technical Command, and questions relating to the adequacy of domestic reserves, the importation of oil and products, access to foreign reserves and the steps to be taken by the government to insure a continued adequate oil supply for the United States.

Thirty-one federal agencies, not including the Interior Department, have been found so far to have an interest in oil, it was disclosed at a meeting last week of the inter-departmental committee advisory to the OGD.

This result of a preliminary survey just completed and inter-departmental oil problems were discussed by the committee, which hereafter will meet regularly first Thursday of each month.

Synthetic Rubber Threat Brings Down Crude Price

The American synthetic rubber industry, based on petroleum, has broken the British-Dutch rubber trust.

The Reconstruction Finance Corporation last week announced that it had arranged to purchase 200,000 tons of rubber from British Malaya at the old price of 20¼ cents a pound, fob Far Eastern port. The deal followed on the heels of a similar purchase of 10,000 tons of rubber from the Dutch East Indies.

The price to be paid coincides with that prevailing before a 3¼-cent increase was agreed to last spring, when the RFC was forced to accept a higher British and Dutch figure because of our great need for rubber. The RFC, however, kept such purchases at a minimum.

With rubber production in the Far East continuing to expand, withdrawal of the United States from the market threatened the continued rehabilitation of those areas, the severity of which was not minimized by U. S. reports that all-out production of synthetic would be continued as long as necessary and that the cost of production had been brought down to a point where it threatened price competition with the natural product.

British rubber officials, here last month to work out a deal with the RFC, were forced to return prices to their former level under threat of being forced out of the U. S. market.

Colorado Lands Offered

Sealed bids for the sale of oil and gas leases of 4000 acres of Ute Mountain Tribal lands will be received by the Consolidated Ute Indian Agency, Ignacio, Colo., until 2:00 p.m., October 25, 1946, according to Floyd E. MacSpadden, superintendent. The lease is offered for a cash bonus in addition to the stipulated royalties of 12½ percent, and rentals of $1.25 per acre per annum.

Inter-Departmental Group Slated To Study Big Inch Bids This Week

The Department of Justice is understood to have declined an invitation from the War Assets Administration to have a member on an inter-departmental committee reported to have been set up to discuss the proposals for disposition of the Big Inch pipe lines.

No official announcement of the appointment of such a committee has been made by WAA, but it is represented that the Interior Department, Federal Power Commission and the War and Navy Departments, in addition to Justice, were invited to name members. First meeting is reported scheduled for October 9.

The study of bids received by WAA is nearing completion, but the matter has not yet gone before the price board of the real property division, which will pass on the matter before it is referred to the review boards on its way up to Administrator Littlejohn for final decision.

Declination of Justice to name a representative on the inter-departmental committee is because the department later will have to pass on any deal made by WAA to determine that it will not create a condition repugnant to the antitrust laws.

Wants Decision Delayed

It was reported that Senator James E. Murray of Montana, chairman of the Senate Small Business Committee, has suggested to WAA that final action on the disposition of the pipe lines be deferred until Congress convenes in January.

The WAA, which has been under the fire of several Congressional committees in recent weeks for shortcomings in its disposal program and derelictions on the part of some members of the staff, would welcome such a delay, which would enable it to get the concensus of Congress on its decision.

However, the slow progress which has been made so far in disposing of the lines is seen as making it quite probable that a final contract will not be developed before the end of the year.

WAA last week called on the 16 bidders for the lines to submit complete information regarding the identity and business connections of all individuals or firms associated with their particular bids.

Officials said the information was desired in order that they might have complete data regarding the proposals, but the report also will be of interest to the Department of Justice when it passes upon the antitrust phase of the disposal.

Holds No County Taxes Due on Submerged Lands

Oil companies need not pay county or other local ad valorem taxes on offshore leases, according to an interpretative opinion handed down last week by Texas' Attorney General Grover Sellers.

The question arose when it was indicated that an oil company, which leased land in the Gulf of Mexico from the state on which there is now production, will deny liability for any county or subdivision tax.

"The submerged lands between the shores of the Gulf of Mexico and the three-league limit are territory of the state but are not included in the limits of any county," the opinion read.

London Representative Of The Oil Weekly

E. N. Tiratsoo, geologist and petroleum engineer, has been named THE OIL WEEKLY editorial representative in London, England.

E. N. Tiratsoo

Tiratsoo was born in London in 1915 and educated at St. Paul's School, where he was a foundation scholar, and at the University of London. He graduated with honors in geology, also taking a special petroleum geology and engineering course at the Royal School of Mines, which he completed with honors in 1937. He won the Watts Medal at the Royal School of Mines which is awarded to the highest geological student of the year. During his period of study he spent his vacation in the oil fields of Roumania and Trinidad, gathering practical experience.

Between 1937 and 1941, Tiratsoo was engaged in geological exploration and exploitation work in the oil areas of the Middle East, principally in Iraq and Palestine.

He joined the Royal Air Force in 1941 and served in England, Africa, India and Burma, mainly in the preparation and execution of paratroop and aerial supply operations. During the course of his foreign service he was able to visit at different times the oil areas of Bahrein, the Punjab, Assam and Burma. He left the Royal Air Force with the rank of Squadron Leader early this year and now is studying for his doctor of philosophy degree at the University of London, under Professor V. C. Illing, F.R.S., head of the Department of Petroleum Technology.

Tiratsoo has published a number of articles in British and Indian scientific and technical journals and his textbook "Principles of Petroleum Geology" will be published shortly. He reads and writes French, German, Russian, Italian, Roumanian, Turkish, Arabic and some Indian dialects.

Canol Approved After Japs Chased Out of Aleutians

Canol was dragged across the Congressional stage last week for what may be the last time, when the Senate War Investigating Committee heard protest from Admiral Ernest J. King over those portions of its fifth annual report singling him out for criticism (THE OIL WEEKLY, September 9).

But under questioning by Senators Harley M. Kilgore of West Virginia, new committee chairman, and Homer Ferguson of Michigan, the admiral admitted that the facts on which the committee's strictures were based were not "wilfully distorted" as he originally charged. He felt any blame for what the Joint Chiefs of Staff did should be placed equitably upon all four, and not upon him alone because he signed letters.

Kilgore told King that in the light of the facts developed by the declassification of the joint chiefs' files on Canol he was willing to issue an amendment placing the blame upon the four top Army and Navy officials as a group.

King admitted that the joint chiefs had approved completion of Canol in October, 1943, on the basis of a report from its joint production survey committee, apparently without going into the project's details.

King expressed ignorance of any statement by late Secretary of the Navy Knox that the project was not worth completing, as well as of an intelligence report submitted in February, 1943, by the naval attache at Ottawa which stated that Canadian officials and experienced oilmen held Canol to be worthless, and other reports to the effect that the conditions which prompted the initiation of the project no longer existed.

Once the joint chiefs had approved completion of Canol, he testified, they never again took up the matter.

The hearing brought out that the joint chiefs originally figured Canol in as a source of supply for air attacks on northern Japan from bases in the Aleutians, but had dropped that plan before they approved its completion. By that time, also, the Japanese had been driven out of the Aleutians and a decision had been reached to withdraw all possible military forces from Alaska.

King admitted that the small amount of products which could be secured from Canol would have been "small potatoes" in any Alaskan operation.

The joint chiefs' decision to continue Canol cost the taxpayers an additional $35,000,000 "to dress a dead horse in the trappings of royalty," Kilgore said.

Compact Selects Theme

"Reservoir control" has been selected as the theme for the Interstate Oil Compact Commission's winter meeting at Dallas, December 9-11.

The commission's executive committee is considering employment of a secondary recovery engineer to coordinate and assist in an advisory capacity the promotion of secondary recovery research programs throughout the nation.

Industry Coordinates Views on Lease Law Regulations at Denver Meeting

Regulations under amendments to the Federal Leasing Act were discussed last week in Denver where 300 operators met with Under-Secretary Oscar L. Chapman, who announced at the close of the session that industry recommendations would be given every consideration and that the new regulations likely would be promulgated by October 25.

Most of the recommendations made at Denver had previously been coordinated and combined by groups and thus it was possible to conclude the session in one instead of the scheduled two days. Chapman praised the operators for their cooperation.

Handling this coordination was a committee headed by Warwick M. Downing of Denver, chairman of the Colorado Oil & Gas Commission and also chairman of the public lands committee of the Interstate Oil Compact Commission. The group was composed of representatives of the Rocky Mountain Oil & Gas Association, Independent Petroleum Association of America, Interstate Oil Compact Commission, Mid-Continent Oil & Gas Association, Montana Oil & Gas Association and New Mexico Oil & Gas Association.

The general attitude of the gathering was expressed by W. H. Ferguson, vice president of Continental Oil Company at Denver, when he said that after reading the tentative regulation drafts, he felt "that the attitude of the Department was sympathetic toward promotion of the development of oil and gas on the public lands," but that such an attitude must be carried forward into the administration of these regulations.

Senator Joseph C. O'Mahoney of Wyoming, co-sponsor of the amendments, indorsed the policy of closer cooperation between the oil industry operations and government supervision as evidenced by the hearing and said, "such a partnership between government and industry can develop only for the public good."

In general the tentative draft of regulations prepared by the department appeared acceptable, but operators questioned some departmental interpretations. L. L. Aitken, Jr., Continental Oil Company, Denver, discussed suggested changes as concerned acreage limitations upon leases and presented for the record a redraft of that section of the regulations.

The Leasing Act provides that the Secretary shall disapprove the assignment or sub-lease only for lack of qualifications of the assignee or sub-lessee or for lack of sufficient bond, but the new regulations specifically state that in a lease the total royalty, including that payable to the government, shall not exceed 17½ percent, thereby limiting overriding royalty to 5 percent. Industry objections to this feature were discussed by H. Leslie Parker, independent, of Denver.

Oppose Established Royalty Price

Gordon Goodwin, of Richfield Oil Corporation, Los Angeles, presented recommendations for miscellaneous requirements, whereas, features of the requirements for acreage held in common by two or more lessees, considered objectionable by the majority of operators, were outlined by L. H. Hines, Standard Oil Company of California, San Francisco.

One of the most controversial points had to do with the government's establishing prices for royalty oil, as proposed in the regulations, and Hal W. Stewart, Ohio Oil Company, Findlay, Ohio, asked for the group that this section be eliminated.

Dean Terrell, Kerr-McGee Industries, Tulsa, presented views of the group on options and assignments and also suggested revisions in other sections following recommendations of the Mid-Continent Oil & Gas Association.

Royalty provisions of the tentative regulations were discussed by Downing and Jack M. Campbell, secretary of the New Mexico Oil & Gas Association.

Russell Brown, IPAA counsel, said that the oil industry "appreciates the fact that Congress recognizes the new situation confronting the oil industry in the need for further development of oil resources on the public domain."

API Washington Offices Assume More Importance

Lack of space in New York to house the marketing division of the American Petroleum Institute will necessitate its location, along with the division of transportation, in Washington. Other branches of the API may eventually follow, not only because of space considerations but also in recognition to the growing importance of Washington as the central point for trade association activities.

API directors also have acted on communications from the Atlantic Coast Oil Conference and California Stripper Well Association pointing out that they had failed to receive invitations to have their presidents serve as members of the trade association group, and voted to extend the necessary invitations.

A suggestion that an API production chapter be established in Venezuela was turned down because of a belief on the part of the directors that, for the time at least, no such outside branches should be set up. The suggestion was forwarded by API members working in Venezuela who had been active in local API work in this country and desired to continue their contacts.

Broader participation of industry members, particularly independents, in the work of the API was sought by the directors in voting to expand the membership on the four division committees by 25 percent. Under the plan, each committee will have 50 members, so chosen as to give every interest in the industry adequate representation.

Gulf Settles Dispute Over Florida Land Rental

Threatened litigation over rental for Florida state-owned lands has been avoided by action of Gulf Refining Company in making payment for land on which it claimed free rentals under lease terms.

Gulf made the payment without issuing any statement as to whether or not it agreed with the Florida Internal Improvement Fund Trustees whose board took no action on the dispute in view of Gulf's decision to make payment.

It was reported in mid-September that Gulf's interpretation of the lease was that it provided rent exemption for the remainder of the five-year period after completion of a dry hole, the Key Largo test. The Internal Improvement Fund trustees felt the interpretation was wrong. Only $960 was immediately involved (two cents an acre) although much more would be at stake if Gulf's huge coastal holdings became involved.

Secondary-Recovery Field In East Is Testing Helium

The first industry test of helium gas as a tracer to chart underground oil and gas migrations in eastern fields has been put under way in the Cabin Creek, W. Va., oil fields, in a cooperative project by the Bureau of Mines and The Pure Oil Company.

The use of helium as a tracer was developed last year in the Elk Hills field. Tests are now under way in a Texas field, but the Cabin Creek project is the first to measure the value of the gas in secondary-recovery gas-drive fields.

The test calls for the addition of one percent of helium to approximately 100,000 cubic feet of gas which will be injected into the wells each day for a week. Samples from selected producing wells surrounding the injection well will be analyzed before, during and after the addition of helium, enabling the engineers to determine the time of arrival of the tracer-laden gas and the ratio of tracer-laden gas to other gas, and to estimate the pore space within the reservoir that is being flushed by the injection of gas.

Department Would Avoid Answering Sun's Queries

Due to respond next Monday to the interrogatories filed by the Sun Oil Company in its answer to the government's complaint in the "Mother Hubbard" suit, the Department of Justice is expected to file objections to Sun's motion.

Tentative efforts to draft answers to the interrogatories which the company told the Federal Court in July would "focus the vague broadside allegations into specific charges of alleged unlawful acts" are understood to have convinced department attorneys of the magnitude of the task.

If the court rules that the department must answer, it will ask for time—probably several months—in which to draft the document.

Downward Trend in Crude Demand Seen As October Forecast of Bureau Nears

A downward trend in demand for domestic crude which will continue, possibly with a slight acceleration, through the remainder of the year will be reflected in the Bureau of Mines monthly forecast for October, to be issued this week.

Average daily demand through the final quarter is foreseen as around 4,720,000 barrels daily, possibly dropping 20,000 barrels below that figure in December.

The October forecast will leave the Texas figure unchanged at 2,120,000 barrels daily, but Oklahoma will be dropped about 2000 barrels and slight changes will be made in other states on a seasonal basis.

The reduction in demand is attributed to refined stocks having built up to a point where a reduction in refinery operations is indicated. Gasoline stocks are in pretty good condition due to continued heavy demand which ran about 209 million barrels in the third quarter, with reductions following a normal seasonal pattern, but there was an unprecedented seasonal increase in distillate stocks, which gained about 21 million barrels during the quarter, while kerosine stocks are up about 7 million and residual fuel 11 million barrels.

Crude stocks showed little change during the quarter, as a result of a decline in exports and the conversion of heavy production into refined products.

Unless a sharper contraction than now anticipated occurs, refined stocks at the close of the year are expected to be about 40 million barrels higher than at the end of 1945.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED October 5	September 28
Alabama	1,000	1,050
Arkansas	75,300	73,300
California	868,700	870,200
Colorado	40,750	37,500
Florida	15	400
Illinois	205,900	209,000
Indiana	18,750	19,000
Kansas	267,300	276,000
Kentucky	31,100	31,100
Louisiana	392,000	390,900
North Louisana	87,100	86,900
South Louisiana	304,900	304,000
Michigan	47,300	46,100
Mississippi	74,300	73,400
Missouri	100	100
Montana	24,450	24,500
Nebraska	700	700
New Mexico	99,750	99,850
New York	14,200	14,050
Ohio	8,000	8,100
Oklahoma	355,350	354,850
Pennsylvania	37,300	37,050
Tennessee	35	35
Texas	2,064,300	2,088,400
Tex. R.R. Comm. Districts:		
Dist. 1—S. Central	19,425	19,400
Dist. 2—Lwr. Gulf Coast	146,400	148,400
Dist. 3—Upr. Gulf Coast	455,900	464,850
Dist. 4—S. West	216,700	220,000
Dist. 5—E. Central	40,300	41,000
Dist. 6—E. Texas. Field	320,300	326,000
Dist. 6—Rest of N. East	102,900	103,500
Dist. 7-B—W. Central	33,225	32,850
Dist. 7-C—West	27,300	27,200
Dist. 8—West	487,500	491,200
Dist. 9—N. Central	129,400	129,000
Dist. 10—Panhandle	84,950	85,000
West Virginia	8,200	8,250
Wyoming	108,750	108,900
Total United States	4,743,550	4,772,735

Total stocks, foreign and domestic September 28, as reported by the Bureau of Mines were 223,043,000 barrels.

Natural Gasoline Meeting This Week in California

The California Natural Gasoline Association at its annual fall meeting, Ambassador Hotel, Los Angeles October 11, will hear Dr. B. H. Sage, California Institute of Technology, describe how the thermodynamic properties of hydrocarbons can be predicted accurately. C. D. Gard and Hugh Colvin of Union Oil Company will discuss economics of LPG operations from the manufacturer's viewpoint. Another paper will evaluate the various methods available for processing absorption plant rich oil.

In the afternoon, following President Kibre's address, Frank West of West and Cole, will discuss the selection of absorption pressures for plants to be installed in high-pressure fields; R. C. Alden of Phillips Petroleum Company will discuss natural gas conversion by the Fischer-Tropsch process and E. G. Ragatz, fall meeting chairman, and will deal with the determination of absorber operating efficiencies.

The evening program will be in charge of CNGA entertainment chairman, Phil Mettling of Cooper-Bessemer Co.

Barges for Sale

The U. S. Maritime Commission is offering for sale 78 composite tank barges constructed of Douglas fir with steel trusses, with a cubic capacity of approximately 8580 barrels, and 51 wooden barges, also of Douglas fir, with a capacity of 8060 barrels.

Prices are $2750 each in lots of one to nine, $1500 in lots of ten to 24, and $1000 in lots of 25 or more, while the wooden barges are offered at $2500 each for one to nine, $1250 for ten to 24, and $750 for 25 or more.

All the barges are laid up at Madisonville, La.

The Maritime Commission also has invited bids for the sale of the motor tanker "Blue Sunoco" (Halawa), built in 1929. Bidding on the 2510-deadweight-ton vessel will not be limited to American citizens. No bid of less than $50,000 will be considered. The vessel now is tied up with the Suisun Bay (California) reserve fleet. Bids will be opened November 13.

Terms Activities of FPC Gas Conservation Setback

The industry faces today through the activities of the Federal Power Commission a threat to the private enterprise system of oil and gas production and a setback to gas conservation, Hines H. Baker, executive vice president of Humble Oil & Refining Company, told a group of newspapermen and writers for technical publications last week visiting the Katy gas field in Harris County, Texas.

"Unless this encroachment of Federal bureaucracy can be resisted and the activities of the FPC be limited to the proper sphere as intended by Congress, prospects for natural gas conservation are dim and increased waste is imminent, to the detriment of the public and the industry," Baker declared.

The trip to the Katy field to inspect the recycling plant and other installations was a part of a tour of Texas oil fields arranged for the press representatives by Standard Oil Company (New Jersey) and Humble.

The Texas trip carried the writers to Stratton-Seeligson area in Southwest Texas, to Tyler, for an inspection of the Hawkins and East Texas oil area, Galveston Bay to witness oil operations in coastal waters, and to the Avery Island field, in South Louisiana.

Throughout the trip the writers were accompanied by H. C. Wiess, Humble president, and other officials of the Humble and Jersey Standard.

Demonstrations in the field were presented by Lane-Wells Company on gun-perforating and gamma ray logging, and by Halliburton Oil Well Cementing Company on electrical logging. Plants of Hughes Tool Company and Schlumberger Well Surveying Corporation also were visited.

Petroleum Tax Receipts Continue at High Level

Treasury revenue from the three petroleum taxes continued at a high level in August, the Internal Revenue Bureau has reported.

Collections included $39,196,558 from gasoline, against $36,622,310 in July; $6,093,151 from lubricating oil, against $9,071,042, and $1,168,799 from pipe line transportation, against $1,392,506.

For the first eight months of the year, however, collections were some $43,000,000 less than for the corresponding period in 1945. The heaviest loss was in receipts from lubricating oil, which dropped to $46,266,023 from last year's eight-month total of $73,355,300. Gasoline collections declined to $259,486,830 from $274,882,519, but pipe-line transportation showed a slight increase, to $9,685,128 from $9,406,892.

Louisiana Allowables Up

Louisiana oil allowables for October are 435,890 barrels daily, an increase of 5148 barrels daily over September. District totals are: Houma 64,567; Lafayette 116,341; Lake Charles 64,469; New Orleans 92,931; Monroe 61,190; and Shreveport 36,932.

Phillips Plans Extensive Additions To West Texas Pipe Line Facilities

Standish Pipe Line Company, subsidiary of Phillips Petroleum Company, has projected a crude trunk line outlet from the Permian Basin sector of West Texas and southeastern New Mexico to augment crude supply for its refineries at Borger, Texas, and Kansas City, Kas. The company will build a 300-mile 10 or 12-inch carrier from West Texas, parallel to an 8-inch natural gasoline line that has been in service since October, 1942, to the Borger refinery. The extension into Oklahoma will consist of an 8-inch unit that will probably connect with the company's system in Oklahoma City field, which has been an important source of supply for the Kansas City refinery.

Phillips has been aggressively building up its crude reserves in the Permian Basin for some years, and a direct pipe line outlet was under consideration on the eve of World War II. The company has about 30,000 barrels daily of production and controlled oil in the Permian Basin, and is prepared to materially boost this output by developing its extensive proved acreage.

A campaign was instituted recently by Phillips for outside well connections within reach of the Standish Pipe Line Company's gathering system, which is connected to the Goldsmith, Embar, West Andrews and Martin fields. The company operates an 8-inch line from the Embar field to its terminal in the Goldsmith field, Ector County, where it is currently delivering 12,000 barrels daily to Gulf Refining Company, pipe line division, under an exchange agreement.

Metex Pipe Line Company, subsidiary of Phillips, is transporting 12,000 barrels daily of natural gasoline to Borger via the 8-inch carrier. Reports have prevailed that the company may utilize the idle capacity of this line in batching high-gravity sweet crude being produced by Phillips in the Keystone-Ellenburger, TXL, Embar and other nearby fields.

Texas Pipe Line Company Announces Plans for 1947

The Texas Pipe Line Company which will construct 140 miles of crude oil pipe lines in the Houston area in 1947, is making a study of constructing, with other interests, a 440-mile, 20-inch line from West Texas to Oklahoma.

One of the new lines will be from West Columbia, Brazoria County, Texas, to Houston, a distance of 60 miles. This 16-inch line will be capable of transporting 90,000 barrels of crude petroleum daily and will connect with existing facilities at Houston.

The second project will be a 22-inch line between Houston and The Texas Company refineries at Port Arthur and Port Neches. It will be 80 miles long, have a maximum daily capacity of 160,000 barrels and will pass south of Beaumont to Port Arthur and Port Neches.

B. E. Hull, president of The Texas Pipe Line Company, said field work will proceed immediately with actual construction of the two crude carriers scheduled for midyear, 1947. Delivery difficulties of materials and equipment may hold up the lines' operation until sometime in 1948. Hull explained that the projects are intended to supplement and, in some instances, replace the existing facilities of the company.

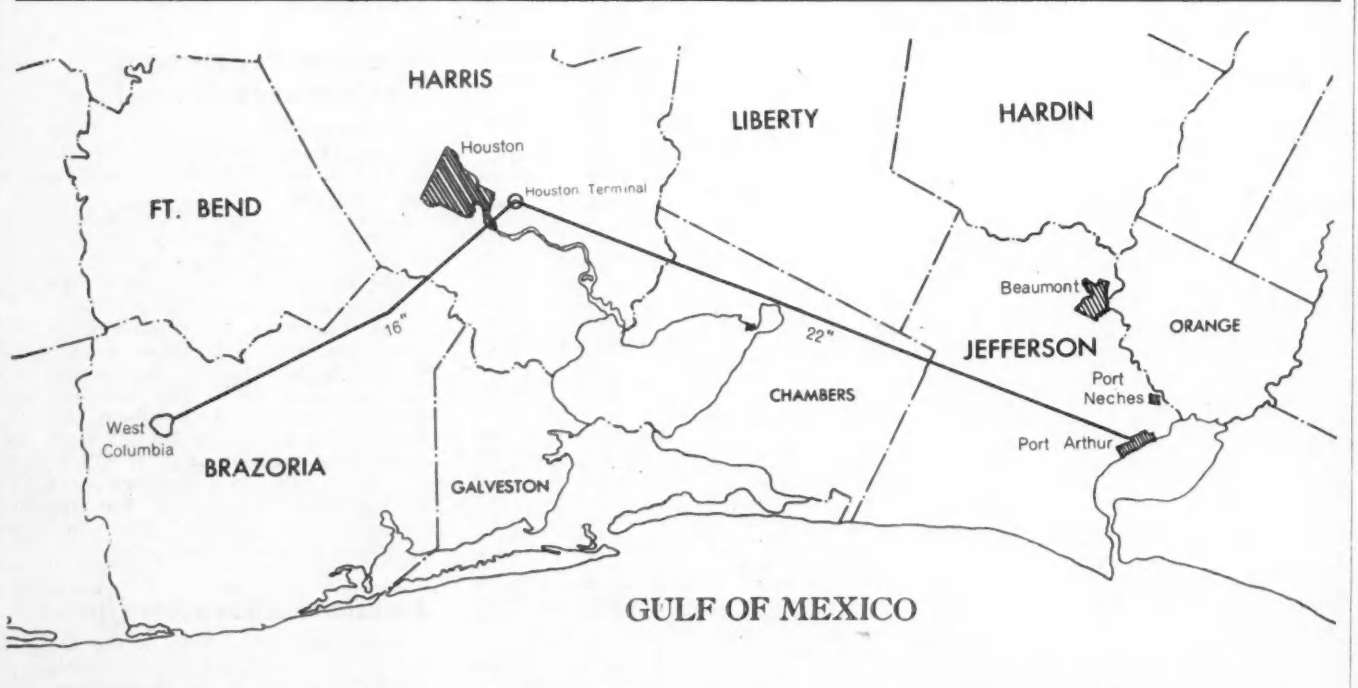
Each of the projects will include necessary pumping stations, tankage and other auxiliary equipment.

Tentative plans for the third pipe line, which The Texas Pipe Line Company is studying with other interests, call for a 20-inch crude line to originate at a point west of Midland, Texas, and extend through the North Texas area to Cushing, Okla., a distance of 440 miles. Capacity is rated at 150,000 barrels daily.

Reynosa Line Hearing Today

Hearings on Reynosa Pipe Line Company's application for construction of a 30-mile, 12-inch transmission line to export natural gas to Mexico will open before the FPC Monday, October 7. The commission last week denied a company motion for reversal of an FPC order permitting the Texas Railroad Commission and the Cia Mexicana de Gas, S. A., to intervene in the proceedings.

Gulf Coast Lines Projected for 1947



Two crude oil pipe lines to be constructed in 1947 by The Texas Pipe Line Company will follow the general route shown on the above map. The 16-inch line from West Columbia to Houston will be 60 miles long with a daily capacity of 90,000 barrels and the 22-inch line from Houston to Port Arthur will be 80 miles long with a daily capacity of 160,000 barrels.

Missouri Firms Oppose Panhandle-Eastern's Plan

The Missouri Public Service Commission and seven utilities operating in Missouri plan to oppose the plan of Panhandle Eastern Pipe Line Company to limit the flow of gas to 47 towns throughout Missouri, a Kansas City report says.

St. Louis and Kansas City are the only exceptions to the plan, which would restrict the flow to 110 percent of any peak day in the past.

Officials of the protesting utilities maintain that Panhandle has extended its gas transmission lines to the East by limiting the consumption of low-rate gas in Missouri, thus permitting Panhandle to sell more gas to industrial areas at higher rates.

Formal Opening Announced Of New Products Pipe Line

On October 15 Humble Pipe Line Company will formally open its new 8-inch, 276-mile finished products line, connecting the Humble Oil and Refining Company refinery at Baytown with North Texas.

Delivery through the pipe line to the Irving terminal, located between Fort Worth and Dallas, actually commenced several weeks ago. Delivery from Irving is by rail and transport trucks to sales outlets over the area. Storage facilities at Irving aggregates 150,000 barrels.

Built of all new steel pipe, the products line has a capacity of 15,000 barrels daily and total cost was about $4 million.

Baylor County Line

Toronto Pipe Line Company, subsidiary of British-American Oil Producing Company, is building 6 miles of 4-inch crude line from a tank car rack site on the Wichita Valley Railroad near Mabelle, Texas, to link its gathering systems in the Mabelle, Rendham and Seymour fields, Baylor County.

These areas are producing 1350 barrels of 36-38-gravity oil daily from 48 wells, and heretofore Toronto has been delivering its gatherings into Shell Pipe Line Corporation's nearby West Texas-Oklahoma 10-inch sour oil carrier. It is understood that the rail shipments will be consigned to British-American's Moose Jaw, Saskatchewan, Canada, refinery.

Purchase Authority Asked

Phebus Pipe Line Company has filed application with the FPC for authority to acquire an 8-mile, 6-inch natural gas line between the Russellville gas field, Illinois, and Vincennes, Ind. The line is owned and operated by Ray Phebus, Centralia, Ill.

Northern Natural Gas Company is seeking FPC authority to acquire from Kansas Power and Light Company, an affiliate, various pipe lines and other facilities in Kansas. The pipe lines involved in Northern Natural Gas Company's application range from 2 to 8 inches in diameter and aggregate approximately 338,000 feet in length.

Drilling Contractors Meet

Rising costs, need for close accounting, and combatting governmental restrictions keynote annual sessions

The necessity of solving high costs and of combatting governmental efforts to restrict United States oil operations keynoted the Sixth Annual Convention of the American Association of Oilwell Drilling Contractors, held in San Antonio, October 1-2.

Expanded research to improve drilling efficiency, use of proper accounting methods to prevent financial losses due to rapidly increasing expenses, better workers' compensation insurance rates, adoption of the most efficient safety program possible, and promotion of the domestic petroleum industry were declared to be urgent needs of the contractors.

Research Program

Declaring it as vital to the contractor as to the producer to uncover new oil reserves, William T. Payne, retiring president of the association, said "We must solve in an economic way the problem of deep drilling and production." To do this, he suggested a research program for the drilling industry comparable with the tremendous programs of the producing, refining and chemical branches of the industry. Payne advocated university drilling engineering courses as one phase of improving drilling methods and equipment.

During the past year the association has sponsored two research projects, and these will be continued and expanded during the coming year. One of these projects has been the study of drill pipe failures in West Texas and the other has been a series of vocational mud training classes for field men. The association's research work is under the direction of its Research Committee, of which J. E. Warren, Midland, is chairman, and Howard Holmes, Dallas, vice chairman.

Batelle Memorial Institute, which is making the study of West Texas drill pipe failures, reported that the failures were being caused by corrosion resulting from contamination of drilling fluids by salt. The Institute reported that experiments indicated that much of the drill pipe failures could be eliminated. The methods used have been:

1. Use of inhibitors through the salt section penetrated and through the formations immediately below. Sodium chromate was reported as the most promising of the inhibitors tested.
2. Use of internally coated drill pipe, either metallic or plastic.
3. Use of a separate string for the salt section, keeping this string out of the lower hole where stresses are higher.
4. The use of any or all of the three above combinations.

The series of mud schools sponsored by the association will be expanded during the coming year. In addition a class in drilling has been commenced at Kilgore University.

Proper Cost Accounting

Contractors were warned by Wallace March, chairman of the association's accounting committee, that they could not continue to absorb rapidly rising costs through increased efficiency. "At some point you will reach your maximum efficiency for specific types of work," he said. "When you reach that point you can no longer absorb the increasing costs without accepting a loss." The committee suggested it would be better to stack a rig and stay in business than to go broke. The association's accounting program was recommended as a valuable guide in calculating costs, and therefore a means of preventing serious financial losses.

Drilling contractors also were urged by William Payne to follow proper cost accounting methods. He pointed out that the recent upward trend in drilling activity did not mean good business conditions, due to the "failure of a few of us to follow proper accounting methods and to give proper weight to price increases for our supplies varying from 13 to 35 percent, work is being done at

Montana Line Approved

The FPC last week authorized Montana-Dakota Utilities Company to construct 28.5 miles of 10¾-inch pipe line in Valley County, Montana, at an estimated cost of $280,000. This line will parallel an existing 8-inch line and will transport additional gas for communities served by the company and for the movement of gas from Bowdoin field during summer and off-peak periods for repressuring and storage in the Baker-Glendive field.

Humble Ups Line

Humble Pipe Line Company is installing 7 miles of 10-inch loop on its Hawkins field 10-inch trunk line to the East Texas field thence east to the Louisiana border, where deliveries of this low-gravity crude are made to Interstate Oil Pipe Line Company. The loop will extend west from its mainline station near Gladewater and will boost the capacity of the Hawkins outlet from 37,000 barrels to 42,000 barrels daily.

Tate a Director

Guy L. Tate, vice president and comptroller for Magnolia Pipe Line Company, has been elected a vice president of the Magnolia Petroleum Company and head of the marketing division. He succeeds George Miller, who resigned because of failing health. W. B. Rew, assistant manager of the marketing division, has been elevated to manager.

or below legitimate cost in entirely too many instances."

Safety and Insurance Costs

It was repeatedly asserted that drilling contractors were paying too high worker compensation insurance rates. An efficient safety program was held up as the best means of reducing such costs. Examples were shown of how specific companies had cut their accidents 20 to 50 percent by using the association's safety program, with the result that their premiums were reduced substantially.

Insurance companies were roundly criticized, it being said that they did not have adequate experience tables to determine proper rates and that contractors pay different rates. It also was pointed out that rates in the Gulf Coast area are much higher than in other parts of the country, but that accidents occurred far less frequently in the Gulf Coast. It also was said that drilling contractors were not getting enough safety assistance from insurance companies, although a part of the premiums were to be used for employment of safety engineers.

It was suggested that the association might meet the situation by forming its own insurance company, by getting uniform rates adopted, and arranging for the association to receive for safety work that part of insurance premiums supposed to be used by the insuring firms for this purpose.

Government Control Menace

Recent proposals that the United States should conserve its remaining oil supply by curtailing domestic output and depending upon larger imports of foreign oil was held up as constituting the greatest peril confronting the industry. Contractors were urged not to underestimate the seriousness of this new menace, and to combat any effort to curtail domestic production or place it under international control.

Such proposals as the State Department's recent declaration that the United States should import 50 percent of its petroleum requirements represent a move by government officials to seize control of all industries of this country, declared Walter S. Hallanan, president, Plymouth Oil Company, Pittsburgh. "It is predicted," he continued, "upon the wholly false premise that there are no more frontiers for the oil industry to conquer; that there remains no more oil of any consequence to be discovered in America, and that consequently we are running out of oil. This policy would ring down the curtain on an industry which has always gone forward to greater heights of achievement."

Whenever American oil production is reduced by half, the independent oil man in this country will be liquidated, Hallanan warned. Declaring the story of this country running out of oil to be an old, thoroughly discredited bugaboo which should deceive no intelligent person, Hallanan said such a plan would have a ghastly effect on the oil industry and also on the country's entire economy and upon its readiness for national defense. "Its enforcement," he asserted, "would destroy the American oil industry, or at best reduce it to a state of impotence, and the oil that has been conserved in the ground would be a hollow mockery without a strong and healthy industry to produce and process it."

Officers Elected

J. E. Warren, of Carl B. King Drilling Company, Midland, Texas, was elected president of the American Association of Oilwell Drilling Contractors at the Sixth Annual Meeting, held in San Antonio, October 1-2, 1946. He succeeded William T. Payne, Big Chief Drilling Company, Oklahoma City.

J. E. Warren

H. C. Milhoan, Milhoan Drilling Company, Tulsa, was elected vice president at large. Regional vice presidents elected were: C. J. Davidson, Davidson Drilling Company, Fort Worth, for West Texas and New Mexico; Emery Carper, Artesia, New Mexico, for cable tools; Joe Morris, Morris & Allen, San Antonio, for Gulf Coast; Sol Mealy, Mealy-Wolfe Drilling Company, Tulsa, for Central Mid-Continent and Rocky Mountain; E. C. Brown, Brown Drilling Company, Long Beach, for California; Guy White, Delta Drilling Company, Evansville, Ind., for Illinois, Michigan, Indiana and Kentucky; and E. E. Pickering, Pickering Drilling Company, Houston, for well servicing.

Charles Paine, Paine Drilling Company, Dallas, was elected treasurer. Brad Mills was reelected executive vice president, and Doyle Settle was reelected secretary.

Good Neighbor Advice

Asserting that South America would become a more important source of oil in the future, J. E. Brantly, president, Drilling and Exploration Company, Inc., Los Angeles, urged the contractors to improve their relations with the Latin-American nationals. "With proper understanding of these people," he said, "we are sure to have friends and supporters throughout our lifetime." By cementing our friendship with these people, he added, "we may have the oil when needed."

Brantly declared it was not difficult to cultivate the people of South America, if the difference in the culture was understood.

Better Hard Rock Drilling

Drilling contractors were told how to improve drilling penetration rates through exceptionally hard rocks by Floyd L. Scott, director of research for Hughes Tool Company. Scott's paper, based on extensive field and laboratory studies, is printed in full in this issue of THE OIL WEEKLY (see page 17). The paper includes pertinent comments on the drillability of different hard formations, the influence of rotation speeds and weights, greater bit service, fluid circulation volumes, reduction of drill stem troubles and the problem of crooked holes.

Cooperation in Equipment Development

Greater cooperation between drilling contractors and manufacturers was stressed by Fred F. Murray, president, Oil Well Supply Company, as the best means of improving equipment. "Users are in the best position to know where present equipment falls short and to foresee needs for new equipment," he declared.

Murray asserted that responsible manufacturers welcome ideas for improvement and maintain close contact with their own and customers' field men. However, he warned that every idea suggested could not be utilized because manufacturers "must at all times strive to produce a standard product to meet the common needs of a large segment of your industry. If equipment is tailor-made to meet individual needs which are not generally subscribed to, then costs are increased, often to the extent that they are uneconomical both for you and for the manufacturer."

The importance of field testing also was emphasized by Murray, who said it was impossible to duplicate actual field conditions in factory tests. "Patience and understanding on the part of owners, drillers and crew men alike will assist in this mutually beneficial development," he pointed out.

Drilling efficiency can also be further improved, Murray stated, by greater cooperation in studying the cause of troubles, since this will make progress in design possible. All these mutual problems, he concluded, merit increasing interest and cooperation between users of drilling equipment and manufacturers.

California Practices

Some of the California drilling practices were discussed by F. M. Kellogg, of K. L. Kellogg & Sons, Long Beach.

In the matter of reducing drill pipe wear, the trend has been toward cutting off worn tool joints and replacing them with new joints, Kellogg stated. There is an increasing use of oversized joints. Many contractors have increased the life of drill pipe by arc-welding a two or three-inch band of hard metal on the tool joints, but some operators oppose this practice because they believe the hard metal prevents fishing tool slips from taking hold.

Tapered drill strings have ben used in some hard digging fields, but Kellogg asserted this has proved troublesome. The trend in California has been to increase the number of drill collars in proportion to the depth of the well. For the medium depth hole four collars are used and on the deeper wells from eight to 12. The derrick height has been increased so that the break down of drill collars in stands will be less, which materially speeds up round trips. The limit in adding drill collars is not known, Kellogg continued, but a common practice is that the weight of the drill collars should be roughly double that carried on the bit.

Pointing out that the weight carried on the bit is the most controversial of all drilling phases, Kellogg said all factors involved had to be considered carefully and varied in accordance with these conditions.

The rotating speed used in California varies from 300 to 350 revolutions per minute, with some operators using as high as 500. The bit design and formations were declared to be the keys to the correct range of operating speeds. Drilling fluids, of course, vary from field to field, but the average mud weights about 70 pounds per cubic foot and has a Marsh viscosity of 28 to 30 seconds based on 500 cc in and out of the funnel.

Hard Rock
ROTARY DRILLING

By FLOYD L. SCOTT, Director of Research,
Engineering Department, Hughes Tool Company

HARD rock rotary drilling combines four main subsurface subjects: The rock, the bit, the circulation and the drill stem, consisting of the drill collars, drill pipe and tool joints.

The Rock: A drilling contract, successfully completed with profit, requires some knowledge of the formation whether it be soft earth or granite. Since hard rock may interfere with an otherwise profitable drilling contract, it is wise to study the properties of the material to discover how best it will yield to the drill.

Knowledge of the properties in the formation to be drilled may prevent a loss on a drilling contract

The crushing strengths of rocks have been determined by the Bureau of Economic Geology in many of our state universities and colleges, for use by the building trade and highway engineers. Figure 1 shows the crushing strengths of some Texas rocks arranged in advancing order, according to data developed by the Texas Bureau of Economic Geology, University of Texas, Austin.

Since dolomite is a hard rock, frequently encountered in the Paleozoic Era, let us examine its crushing strength. In Figure 1 note that it ranks almost equal to granite. Pure dolomite has a Moh's scale hardness —3.5-4 and is hard enough to scratch a penny, while the hardest limestone or marble, having a Moh's scale hardness of 3, will not. Sandy dolomite, or sand rock having a dolomite binder is as difficult to drill as granite. When chert (flint) is present in dolomite, the combination offers greater resistance to penetration than granite. Note also in Figure 1 the crushing strength of quartzite, 68,000 pounds per square inch, the highest value known for sedimentary rocks. Quartzite may be encountered in the Mesozoic and Paleozoic Eras.

Having compared the crushing strengths of various hard rocks, let us connect their local names with geology and geography. Some of these are listed in Table 1.

"Hard, Hard" Rocks

The term "hard" as applied to rock in preceding paragraphs defines its comparative crushing strength or resistance to penetration. Another use of the word "hard" is in the sense of its abrasive property, or its ability to cause rapid wear. The Moh's Scale of Hardness was created to measure, by convenient means, the comparative resistance of one material to the abrasive or scratching action of another. For example the diamond was rated —10, corundum (aluminum oxide)—9, topaz—8, quartz —7, feldspar—6, etc., each scratching the other in descending order.

The most abrasive formations the oil

Presented at the Annual Convention of American Association of Oilwell Drilling Contractors, October 2, 1946, San Antonio.

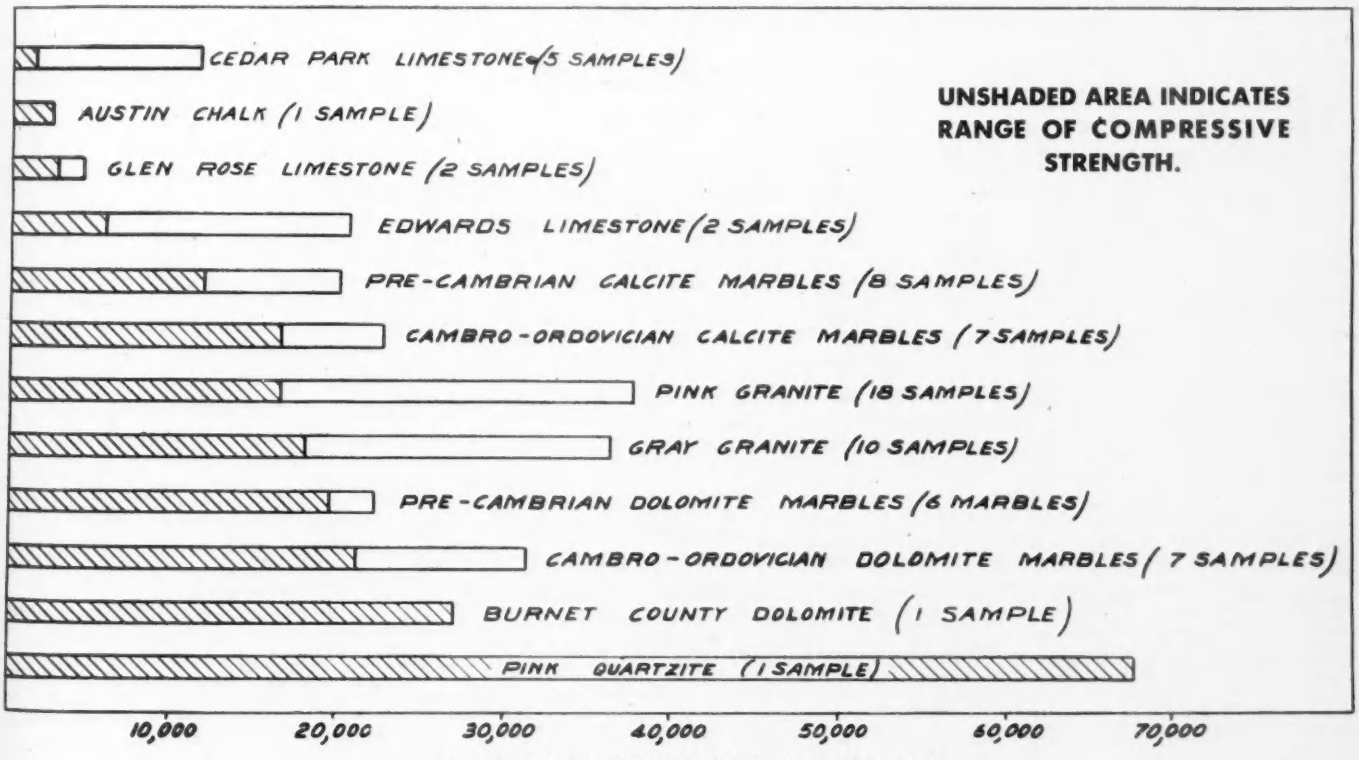


Figure 1. Compressive strength of Texas building stones.
(Information submitted by University of Texas Bureau of Economic Geology, except for pink quartzite)

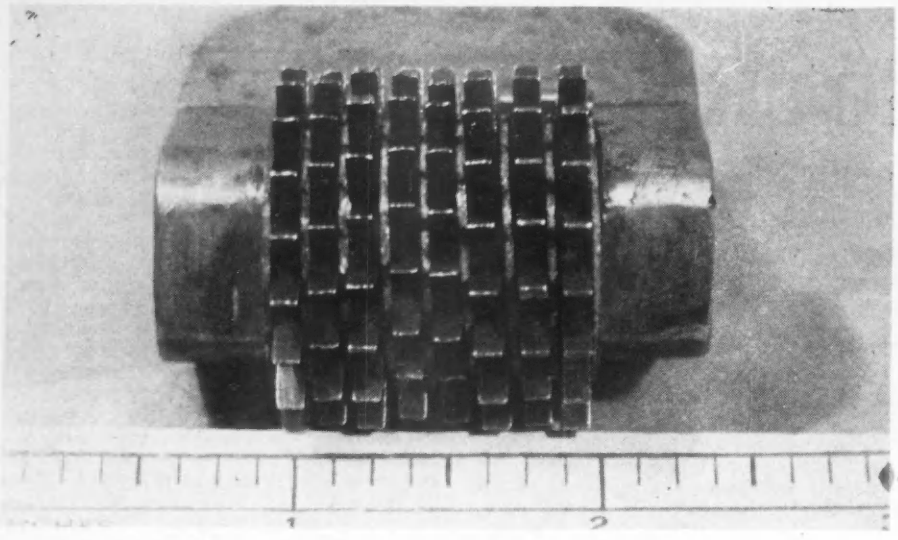


Figure 2. Bottom view of microbit.

Figure 3. Side view of microbit.

well driller usually penetrates have a hardness of 7 on Moh's Scale. Silica sand, chert, flint, chat and quartz, having a hardness of 7, and iron pyrite, hardness 6-6.5, are the familiar names of those minerals that wear out drilling tools. Since the hardness of the steel cutting surfaces of rotary drilling tools is approximately 7, there is need for wear protection which is provided by tungsten carbide rated at 9.4.

Summing up briefly the two meanings of "hard," we might borrow an expression from the Louisiana coast country and say that dolomite mixed with sand is "hard hard." The driller finds it to be so, for such formations are as hard to drill as granite.

To assist in correlating the drillability of a rock with crushing strength, a laboratory tool (Figures 2 and 3) was developed to "feel" of small rock samples. Called a microbit, it is run with various effective weights in an ordinary drill press at 45 revolutions per minute. A small depression (Figure 4) remains after the test. Rate-weight results are illustrated in Figure 5. Note how drilling rate decreases as crushing strength increases and how close the drillability of dolomite approaches that of granite. Drillability in this discussion is defined as a rate-weight ratio where rate is feet per hour and weight is pounds force acting on the bit.

Figure 6 indicates the drillability of a few different rocks developed from sharp full-size rock bits. Here again, the greater the crushing strength, the slower the drilling rate for a given bit loading.

To use Figure 6, assume that a driller is instructed to use 8000 pounds at 60 rpm on an 8-inch bit and he is to make hole through the rocks in the order shown, starting in soft limestone. The following drilling rates can then be expected:

Soft limestone	40 ft./hr.
Marble	10 ft./hr.
Dolomite	2 ft./hr.
Granite	1½ ft./hr.
Quartzite	¼ ft./hr.

On the other hand, still remembering Figure 6, if the driller were instructed to maintain a constant penetration rate of 5 ft./hr., allowing the weight on his 8-inch bit to vary as required, then the following loads would be required:

Soft limestone	1,600 lbs.
Marble	5,600 lbs.
Dolomite	13,600 lbs.
Granite	14,400 lbs.
Quartzite	24,000 lbs.

As indicated in J. E. Warren's Paper, API 851-20 B, June 6, 1946, on "Rate of Penetration in Hard Formation Drilling," the use of heavyweight, where applicable, improves footage and penetration rate in the hard dolomite in the Fullerton field, West Texas. However, in some softer formation increased weight only founders the bit. The trial and error method must be used to get best results.

Where long strings of collars are used to obtain weight, it has been found best to rotate at 50-60 rpm to avoid connection trouble and excessive bearing wear in bits. Weights of 35,000-40,000 have been successfully used on 8¾-inch bits and 60,000 on 12¼-inch bits.

TABLE 1

Geology and Geography of Various Hard Rocks

Local Name	Composition	Geologic Period	Geographical Location
Arbuckle lime	Dolomite	Cambro Ordovician	Okla.-Kan.
Devonian lime	Dolomite	Devonian	Ky.-Ill.-W. Tex.-Cent. Tex.
Devonian chert	Dolomite and chert	Devonian	W. Texas
Ellenburger lime	Dolomite and chert	Ordovician	W. Tex.-N. Mex.
Embar lime	Dolomite	Permian	Wyoming
Gilcrease sand	Quartzite	Pennsylvanian	Okla.
Mississippi lime	Dolomite	Mississippian	Okla.-N. Tex.-West Cental Tex.
Madison lime	Dolomite	Mississippian	Montana
Oriskany sand	Quartzite	Devonian	Ohio-West Virginia
Travis Peak sand	Quartzite	Cretaceous	N. La. and E. Tex.
Viola lime	Dolomite	Ordovician	Okla.
Wilcox sand	Quartzite	Ordovician	Okla.

One conclusion can be drawn from the foregoing. In dolomite we are dealing with a hard rock having high strength. A sharp bit, when run on dolomite with initially heavyweight will suffer undue tooth breakage. A program including a minimum starting weight with a gradual increase as the bit dulls would not only maintain an average desirable penetration rate throughout the run but should secure more footage per round trip.

The Bit: Through the years different kinds of rotary bits have been invented. A barber in France invented the diamond bit, the Scotch the shot drill, and the Americans the rolling cutter type of drill for penetrating hard rock.

The roller type drill consists essentially of teeth provided on one or more rollers supported by bearings mounted on a bit body. The drill stem provides the weight to cause the teeth to penetrate the rock as the assembly is rotated by power at the surface. Circulating fluid is pumped down the stem to clean the cutters and carry the cuttings up to ground level.

As the teeth are rolled into hard rock, bending stresses are set up tending to break off the tooth crests. Abrasive minerals in the rock scratch and tear at the teeth to dull them. Circulating fluid more or less sand laden tends to blast away the entire cutting surface. Only the highest type of steel can live under these circumstances. Tungsten carbide protection at the gauge, especially, is necessary for preserving well bore diameter.

Because of high stress and shock loads the cutters must be made of carburized steel to provide against breakage and loss in the hole. The estimated strength of the case is 300,000 pounds per square inch and that of the core is 125,000 pounds per square inch.

Creeping Cutters

For hard rock the teeth are spaced to provide maximum depth for longer life, and minimum included angle for delayed dulling, yet having adequate section to resist breakage. As the teeth on the cutters contact bottom they tend to generate rock teeth. This is discouraged as much as possible by tooth arrangement to destroy the rock gear. There is a noticeable creep of the cutters as they roll on bottom as can be

seen by the spiral markings on cores taken with roller type core bits.

Perhaps this creep is responsible for reduction in footage per round trip when high rotary speeds are employed. Rate of penetration in almost any formation is increased by fast rotation and this is preferred technique in some localities where conditions warrant. In general, the slower the rotation, the greater the footage per round trip.

The bearings on which the cutters are mounted have a life expectancy depending on the weight used and the speed of rotation. Figure 7 drawn from data published by Roller Bearing Manufacturers indicates generally the capacity of bearings of a size that could fit in various sizes of roller cutters. Note that the capacity of a bearing is increased by reduction in speed of rotation. Also note that the bearing in a 12-inch bit can support considerably more than twice as much weight as that in a six-inch bit.

Figure 8 has also been drawn from data published by Ball and Roller Manufacturers. This shows that a bearing having the size to fit in a roller cutter on an eight-inch rock bit will last 27 hours at 50 rpm as compared with 18 hours at 100 rpm, assuming a load of 20,000 pounds. Both Figures 7 and 8 are exhibited more to show the general effect of rotary speed rather than to show absolute bearing values.

After a year of experience with heavyweight operation in West Texas, the bearings in rock bits have given satisfactory performance at rotary speeds of 50-60 rpm.

Circulation: The circulating fluid is employed primarily to bring the cuttings to the surface. In the soft gummy formations such as the Red Beds, gypsum, etc., large-volume circulating is necessary to clean the cutters for fast penetration rates. In the hard rock strata, however, there is not as much need for as great a volume and considerable savings may be realized from a reduction in rpm of the mud pump, other conditions permitting.

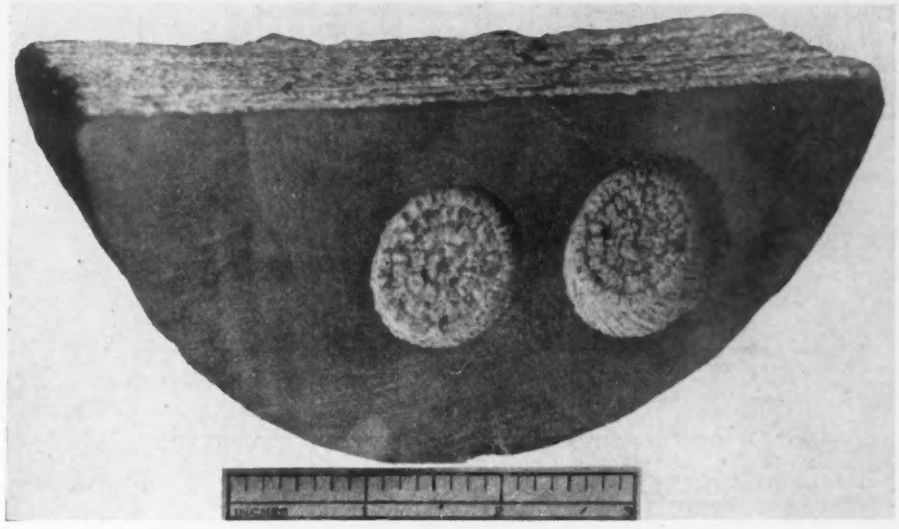


Figure 4. Bottom made by microbit in dolomite core from Sealy-Smith West Texas well.

Cuttings of the various hard rocks have been timed as they fall through clear water and mud. Chips of limestone, dolomite, anhydrite and granite fall through clear water as an average rate of 1 foot per second and through 35 viscosity mud at an average of ¾-foot per second. Upward velocity of flushing fluid around the outside of the drill pipe must, of course, be greater than their rate of fall to bring them to the surface.

To visualize what goes on at the bottom of the hole let us assume that an 8¾-inch bit on 4½-inch drill stem is drilling in hard rock at ten feet per hour with a flushing fluid rate of 400 gallons per minute. By simple calculation we find that, for each elapsed second, the bit has advanced downwardly 1/30-inch and in that same second the flushing fluid has moved up the hole 34 inches. The concentration of cuttings per inch of the fluid column outside the drill stem is thus seen to be exceedingly small. Perhaps a reduction in rate of circulation to 2 feet per second in known areas where hard rock is being drilled would work just as well and also effect economies in fuel and upkeep of equipment.

The black shale encountered in West Texas does not drill well when certain additives are mixed with the circulating fluid. Perhaps a filter cake, even though it be thin, forms on bottom as well as the wall of the hole to form a blanketing diaphram which might well hold cuttings there against dislodgment. Laboratory tests indicate a reduction in speed when cutting porous sand rock using mud when back pressure is placed on returns, although no difference could be found with the same mud drilling under atmospheric pressure as compared to clear water. It does not seem readily apparent at this time what can be done to improve this condition.

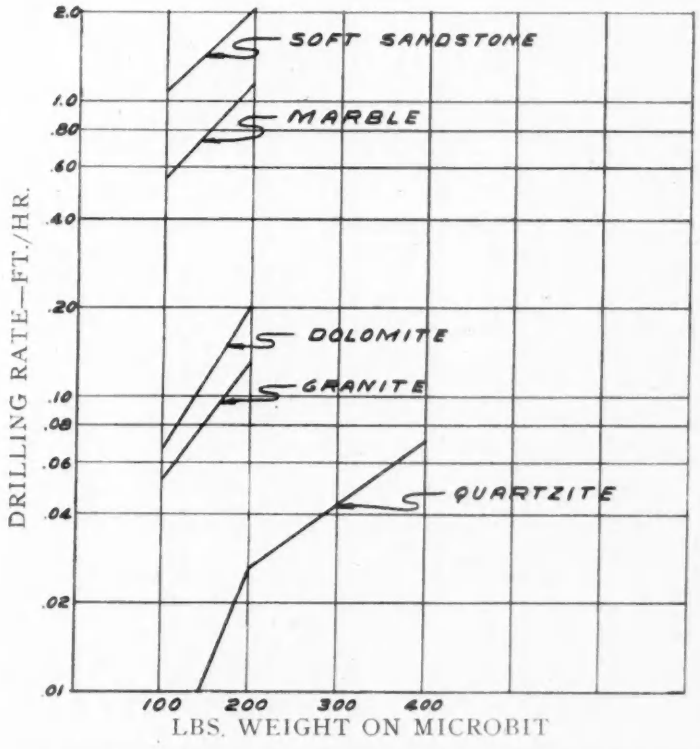


Figure 5. Drillability of formations obtained with microbit at 45 rpm.

The Drill Stem: Drill collars at the bottom of the drill stem if properly cared for do not give much trouble. Certain facts have come to light in recent years, however, that indicate further reduction of connection trouble can be attained. Metallic lead-base lubricants, seem to have noticeable superiority over the zinc-base type. Reason for this superiority may be found in the physical properties of the two metals.

Lead, being much weaker than zinc, does not build up as thick on contacting surfaces under pressure as does zinc. Laboratory tests also show that lead smears out in a thin foil on tool joint shoulders whereas the particles of metal in zinc-base lubricants tend to gather in drifts to form a hard island pattern which may be compressed to a thinner dimension while the drill collars are at work.

Prevention of Galling

The whole idea of metallic base lubricants is to prevent metal-to-metal contact, and subsequent galling of connecting threads and shoulders. Careful

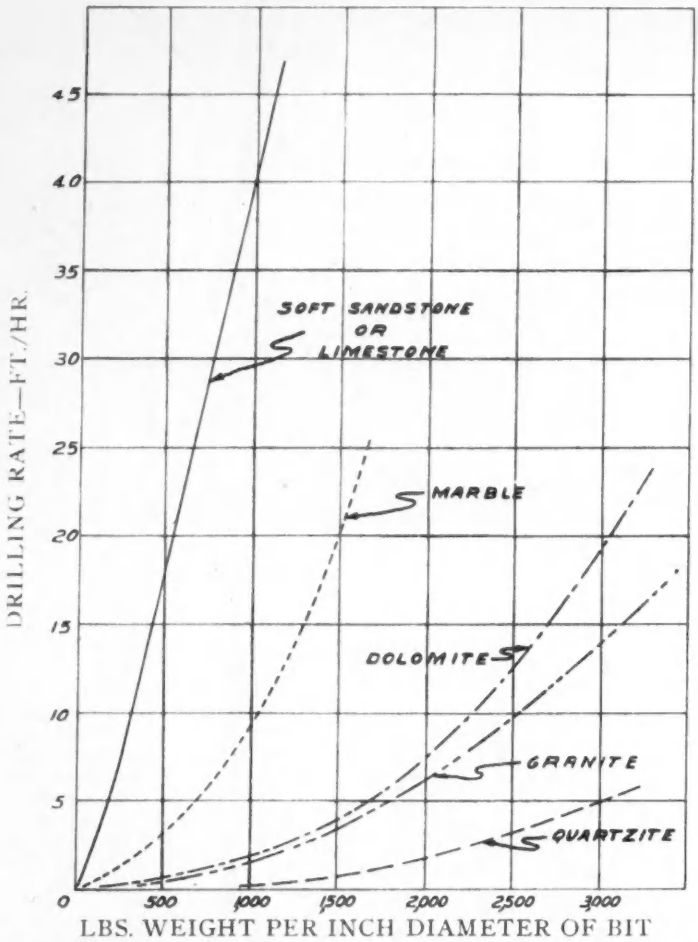


Figure 6. Drilling rate vs weight on rock bits at 60 rpm on various formations. Bit sizes 4¼ to 12¼ inches diameter.

laboratory tests have shown that a prevent galling of connection surfaces, they should not be allowed to touch. Measurement of force acting on a 4½-inch API full hole tool joint shoulder shows that the stress set up amounts to 100,000 pounds per square inch, using a torque of 12,000 pounds feet. This is the torque usually applied with four wraps on the cat head. Nonmetallic greases squeeze out under this pressure.

Even small galls which create a phonograph record surface on a tool joint shoulder represent small keys which help prevent sufficient make-up. Sufficient make-up implies that the pin stretches and the box squats elastically to store up enough reserve of compression in the connection that tightness is insured, even after minute irregularities are ironed out while the joint is working. The ironing out process, of course, tends to loosen a joint. Various metallic platings such as copper and zinc have shown good resistance to galling, especially in the tender breaking-in period when new connections are made up. A properly tinned shoulder, using "half and half" solder is also good protection against galling.

Another source of connection trouble seems to lie in the disposition of the pin with respect to its service as a driver or a driven member. Stated simply, more wobbling failures seem to happen when the pin points up (box drives pin), than when the box points up (pin drives box).

This phenomenon of mechanics can be called planetary action, since friction drive between pin and box threads tends to rotate the pin faster than the box. When this happens, the pin will make up tighter when it is pointing down, but if the pin points up the connection tends to loosen and even come entirely unscrewed despite the fact that drill-stem torque could be expected to prevent such action. Wherever possible, it is wise to use a tool joint pin pointing down. The same rule applies for both right hand and left hand connections.

To our knowledge, the first printed record on planetary action is contained in an article by John T. Hayword.[1] His experience confirms that of others. The drillers even have a name for it. They call it a "wabble off."

Crooked Hole: It is important to

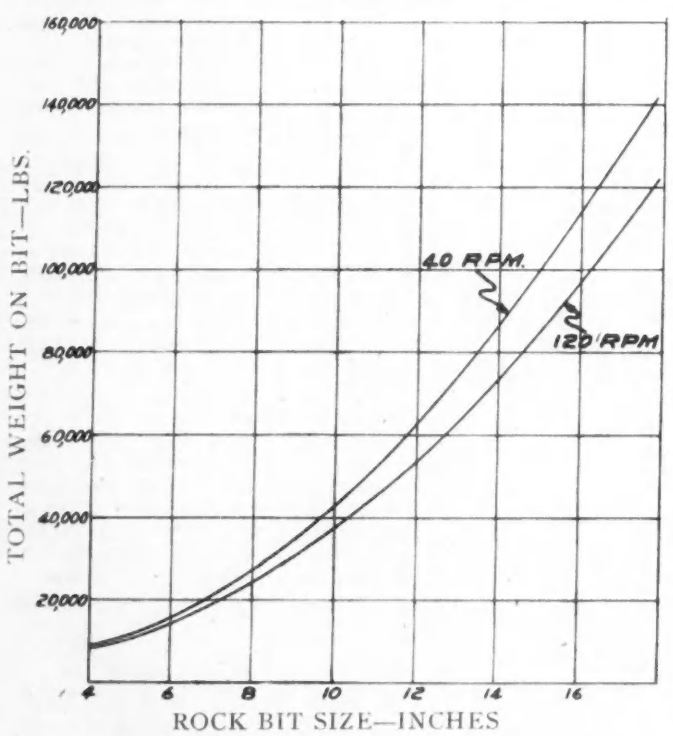


Figure 7. Effect of rpm on roller bearing capacity (based on ten hours life).

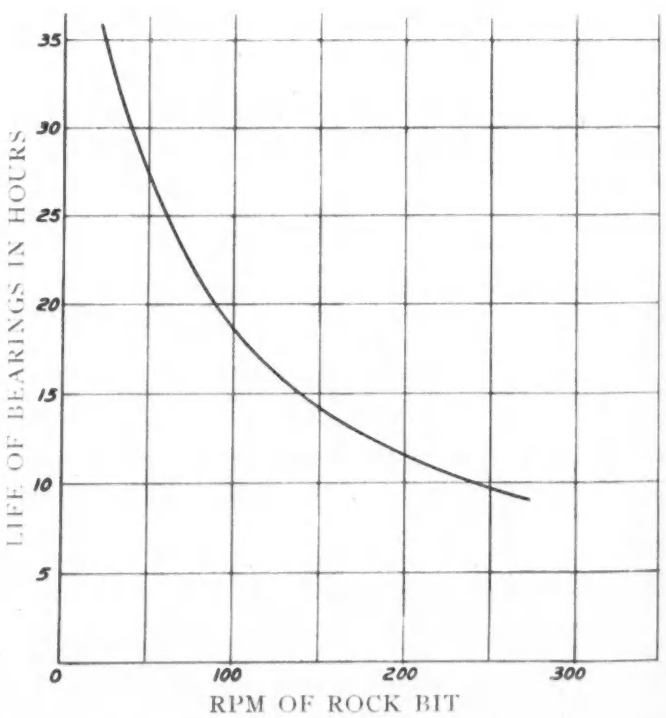


Figure 8. Effect of rpm on roller bearing life of eight-inch rock bit at 20,000 pounds.

know how to apply weight on the bit, what lubricants to use, etc., but before the rotary drilling contractor can sell his product to his customer, the hole must be straight within the tolerances set. One outstanding element of those drilling areas where the hole "goes off" is formation slant with the horizontal. Mountains, foothills, dome structures all provide potential hazards to meeting the three-degree tolerance from vertical.

An interesting article[2] by John I. Hoffman, presented before a meeting of diamond drilling contractors in London, April 11, 1912, describes the travail suffered in those days with crooked hole. Figure 9, taken from this article, illustrates the setting of whipstocks to bring the hole back toward vertical. This hole was off 51 degrees at a depth of 5369 feet. Although this paper was written 34 years ago the thoughts expressed in its discussion border on our present day conceptions in respect to crooked hole. In this discussion, W. H. Trewartha-James from Western Australia, contributed the thought that "I believe this (crooked hole) is due almost entirely to planes of hardness in the structure of the rock passed through lying at an angle with the hole."

"Up Structure" Drift

Directional surveys of holes in California, Wyoming and Canada indicate that the majority of holes tend to drift "into the hill" or "up structure." Perhaps James was right. If he were, it would seem wise to hold up weight on the bit when it begins to run rough, to allow time for removal of the cause for deflecting the hole. In areas where the formation bedding planes lie horizontally, little trouble is experienced. Perhaps the conditions existing in "flat" country to preserve straight hole are also those which tend to deflect the well bore from vertical in slanting formations.

REFERENCES

[1]The Oil and Gas Journal, May 28, 1931.

[2]Recent Practice in Diamond Drilling and Bore Hole Surveying, Bulletin No. 91, Institution of Mining and Metallurgy, April 11, 1912.

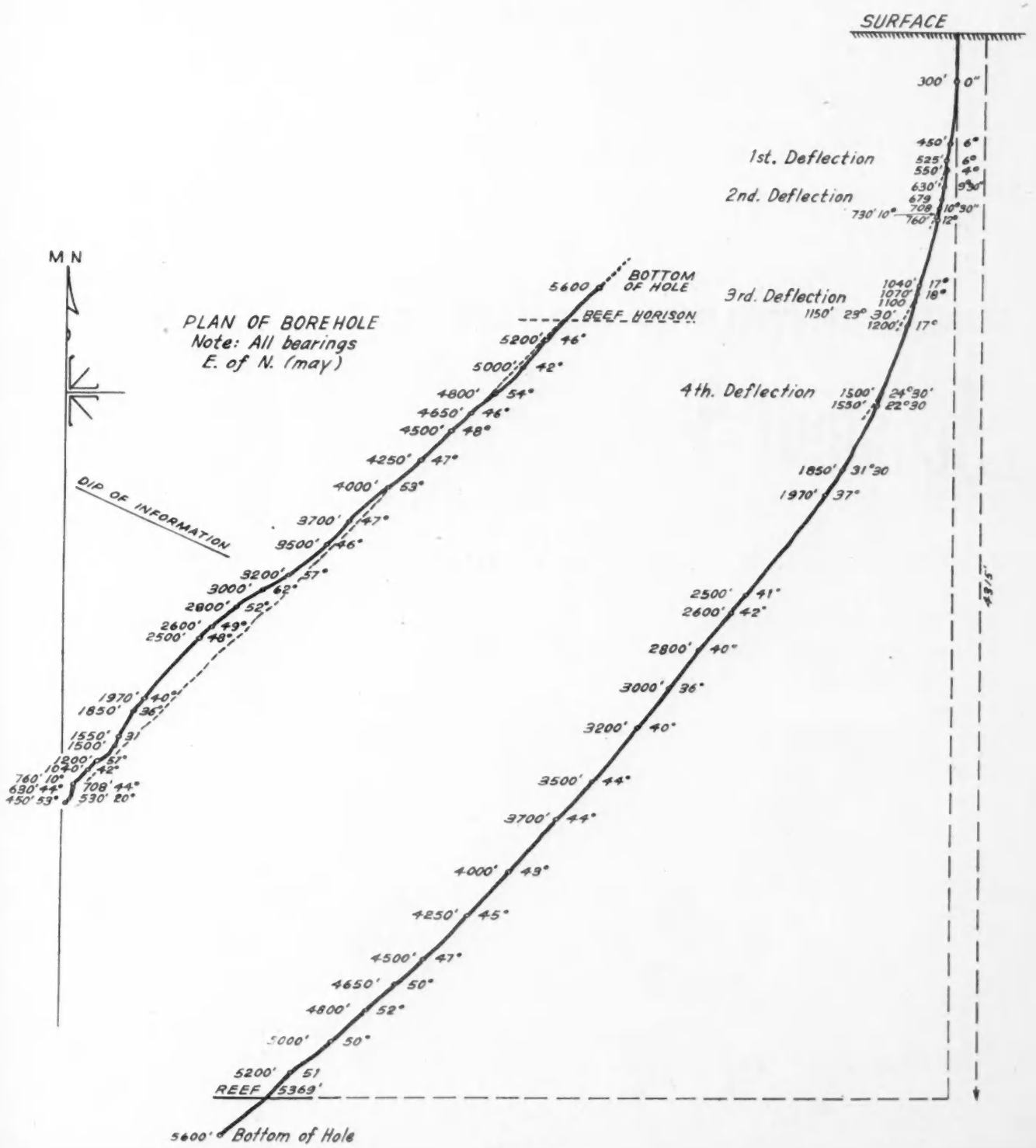


Figure 9

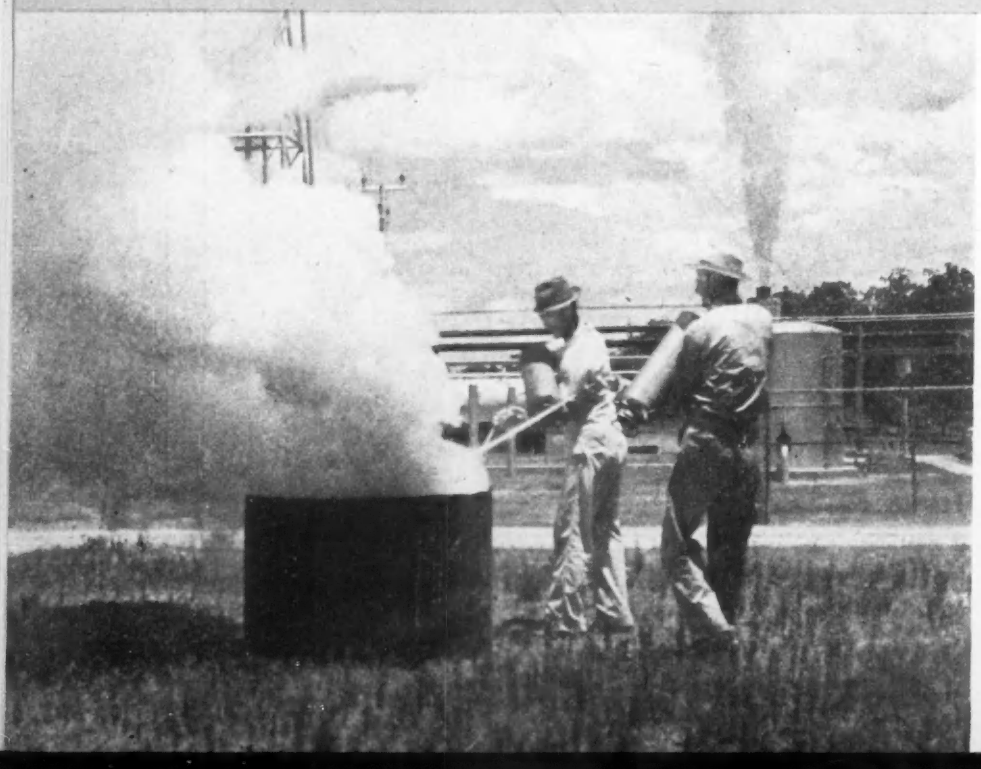
At the sound of the plant fire whistle workmen respond with hose cart and extinguishers.

FUNDAMENTALS OF INDUSTRIAL

Accident Prevention

By C. L. HIGHTOWER, Safety Director
United Gas Pipe Line Company and Union Producing Company

Demonstrating at regular plant drills the proper method of extinguishing fires.



Part 10

Fire Protection Equipment

THREE elements are essential to fire. These are: fuel, oxygen and heat. When all three are present in the right proportions a fire and/or explosion will result. If any ONE is removed a fire or explosion cannot occur. All fire inspections should be made with the thought constantly in mind of keeping these elements separated or removing one of the three when they are found in combination at the same point.

Hand fire appliances provide the greatest saving of property and life of all fire protection equipment. Fifty to 90 percent of all the fires occurring in industry are extinguished with hand fire appliances without the necessity of calling the fire department.

The three major methods of extinguishing fire are cooling, smothering, and separation of flame from the fuel. By cooling, the generation of flammable vapors is stopped; by smothering, the oxygen supply which is necessary for combustion is cut off; and by separating the flame from the fuel, success is attained if no other source of reignition is present.

Fires are divided into three classes according to their fuel and the method necessary for extinguishing. All extinguishers approved by the Underwriters Laboratories, Inc. are plainly marked for the class or classes of fire they will extinguish.

Class "A" fires are fires that have materials such as wood, paper, textile, rubber, excelsior, rubbish, etc., as their fuel. These fires are extinguished by cooling with liquids or with extinguishers which use large percentages of water.

Loaded Stream (Instant) and foam type extinguishers are recommended for Class "A."

Class "B" fires are fires in flammable liquids, greases, etc., such as gas, gasoline and oil. These fires are put out by blanketing or smothering to exclude the oxygen.

Carbon-Dioxide, Foam and Dry Chemical type extinguishers are recommended for Class "B."

Class "C" fires are fires in live electrical equipment. These fires require an extinguishing agent which does not conduct electricity in order to protect the operator against the danger of electrical shock.

Carbon-dioxide type extinguishers are recommended for Class "C."

Maintenance of extinguishers cannot be stressed too greatly. There is a tendency to assume that because an extinguisher has nothing to do until a fire occurs, it does not require attention. Inasmuch as chemicals, pressure, mechanical parts and other features having a bearing on proper operation are all subject to the ravages of time, tampering or neglect, it is obvious that frequent maintenance is very important to proper performance.

Having an extinguisher that will perform as intended, another important item is its effective application. Regardless of its availability, condition, or potential effectiveness, all may be lost by improper application. Furthermore, additional hazards may be created, including danger to the operator.

Operation and maintenance of various types of fire extinguishers are described and pictured on the following pages.

Model "C" Instant

(Loaded Stream Type)

Use on class "A" fires (wood, paper, trash, etc., leaving glowing embers).

Operation

1. Grasp hose close to nozzle between thumb and index finger of right hand.
2. Holding hose, grasp ring cap, while left hand grasps bottom. Lift extinguisher from bracket.
3. Carry extinguisher by ring cap. Keep firm grip on hose nozzle.
4. To discharge invert extinguisher and bump on floor or ground in order to break seal on gas cylinder. Hold nozzle firmly. Keep safe distance from fire. If outdoors, approach from windward.
5. Discharge stream at base of flame and work upward.

Maintenance

1. Inspect every three months.
2. Weigh small gas cylinder and replace when the weight loss is 1 ounce or more. Weight is stamped on cylinder.
3. Replace gas cylinder after each use of extinguisher or accidental breakage of gas seal.
4. Liquid level should be checked at each inspection. Add liquid when needed.
5. Check hose for obstructions. Keep paper or other easily discharged objects over hose nozzle to prevent insects from entering hose.
6. At least one extra gas cylinder with refill should be available at all times.
7. Keep inspection tag up to date at all times by signing and recording information after each inspection.
8. This extinguisher does not need recharging annually.
9. Will not freeze.

Caution: Do not use on class "B" or class "C" fires. The liquid is a conductor of electricity.

PASS IT TO HIM

The Game Depends Upon It

Posters such as this encourage good safety habits among employes.

Fire Extinguisher Chart*

TYPES		Foam	Soda-Acid	Anti-Freeze	Vapor Lq.	Car. Dioxide	Dry Powder
Chemical (Obtain Charges from Manufacturer)		Sol. of Aluminum Sulphate and Bicarbonate of Soda with Foam Agent	Bicarbonate of Soda Sol. and Sulphuric Acid	Special Charges	Carbon Tetrachloride with Important Components	Carbon Dioxide	Bicarbonate of Soda and Other Powders
Operating Method		Invert	Invert	Invert or Invert and Pump	Pump or Open Valve	Open Valve	Open Valve
Extinguishing Effect		Blanketing	Cooling and Quenching	Cooling and Quenching	Blanketing	Blanketing	Blanketing and Sweeping
Protection from Freezing Required		Yes	Yes	No	No	No	No
Use on Class "A" Fires	Wood, Rubbish, Textiles, Etc.	Yes	Yes	Yes	No—but has some value on small fires	No—but has some value on small fires	No
Class "B" Fires	Oils, Greases, Paints	Yes	No	No	Yes Blanketing	Yes	Yes
Class "C" Fires	Live Electrical Equipment	No	No	No	Yes	Yes	Yes

* Reprinted by permission of National Safety Council.

FIRE EXTINGUISHER INSPECTION REPORT

Date_____

Location_____

Make and Type Extinguisher_____
Class Fires Recommended For—A( ) B( ) C( )

Condition of Extinguisher and Fittings_____

Repairs or Replacements (Give weight of gas cylinder)_____

Date of Previous Inspection_____

Remarks_____

Inspector_____

NOTE: Inspection should be made and reported at each Safety Meeting.

Grasp hose close to nozzle between thumb and index finger of right hand.

Holding hose, grasp ring cap, while left hand grasps bottom. Lift extinguisher from bracket.

Carry extinguisher by ring cap in upright position to fire. Keep firm grip on nozzle.

Discharge by inverting extinguisher holding by bottom handle. Hold nozzle firmly. Keep safe distance from fire.

Soda-Acid Type

Use on class "A" fires (wood, rubbish, cloths, paper, etc.) only.

The soda-acid type extinguisher employs the wetting and cooling principle to extinguish fire.

Caution: Soda-acid extinguishers are not suitable for class "B" fires (gasoline, oils, grease, etc.) and should never be used on class "C" fires (electrical equipment) as the liquid is a conductor of electricity. Protect from freezing-caps.

Attack the base of the flame and work upward. Walk around fire carrying extinguisher by bottom handle.

Clean and recharge immediately after use. *Discharge and recharge annually.*

Inspect every six months. Check hose and nozzle for obstructions, check screen, acid bottle and stopple, cap gasket, and relief hole or holes. Post information, date and sign tag on extinguisher.

Dry Chemical

Use on Class "B" fires (gasoline, oil, flammable liquids, natural gas and other petroleum products).

Keep extinguisher in upright position. Break wire seal holding lock-pin and remove pin. Open valve to the left (left hand threads). Point nozzle at base of flames, press nozzle release and sweep powder along base of flame.

Pressure cartridge must be replaced after each use of extinguisher or accidental breakage of gas seal on cylinder. At least one extra pressure cartridge should be available at all times.

Inspect every three months.

Remove and weigh pressure cartridge. If weight loss is more than 1 ounce, replace with new cartridge.

Check hose for obstructions and see that powder is dry and flows freely from hose. Check powder level in extinguisher and add when necessary. Replace caked or lumpy powder.

Replace wire seal on locking-pin when found broken and after each use of extinguisher. Record necessary information on tag after each inspection and sign.

Annual recharging is not necessary as the contents do not deteriorate.

Caution: This type extinguisher should not be used on Class "A" fires (wood, trash, etc.) as they leave glowing embers. Water or other approved liquids are the best extinguishing agents for Class "A" fires.

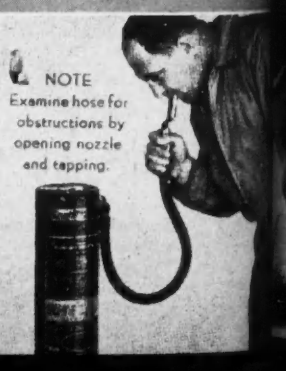
Open nozzle, direct stream at base of flame, using rapid side-to-side nozzle motion.

After using, invert extinguisher, open nozzle to release pressure and clear hose, then remove cap and fill.

Remove cartridge from head ring, replace with a charged cartridge.

In maintenance, remove fill cap, examine chemical, and check hose by blowing through open nozzle.

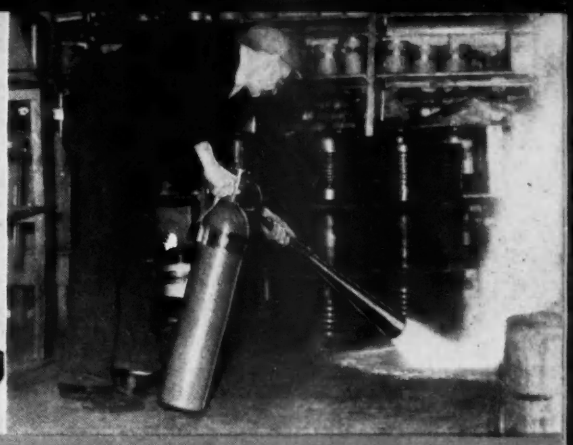
- NOTE -
Cartridge has left hand thread. Before replacing cartridge turn hand wheel to right and insert lock pin. See that cartridge well is clean.



NOTE
Examine hose for obstructions by opening nozzle and tapping.

Remove from rack and carry by handle in upright position.

To operate set cylinder on ground, remove horn and hold grip firmly with one hand. Pull pin and open valve with other. Small units may be held in one hand and operated with other.



For fires on flat surfaces, direct discharge at nearest edge of fire and, using sweeping side-to-side motion, extinguish nearest section first, then follow up fire. To conserve gas, close valve temporarily when moving around fire.

Carbon Dioxide Type

(Liquid)

Use on class "B" fires (gas, oil, flammable liquids, and other petroleum products) and class "C" fires (electrical equipment).

This extinguisher must be returned to the manufacturer for recharge. Keep nearest recharge station address posted on inspection tag.

Record necessary information on tag and sign after each inspection. Replace tag when lost or damaged.

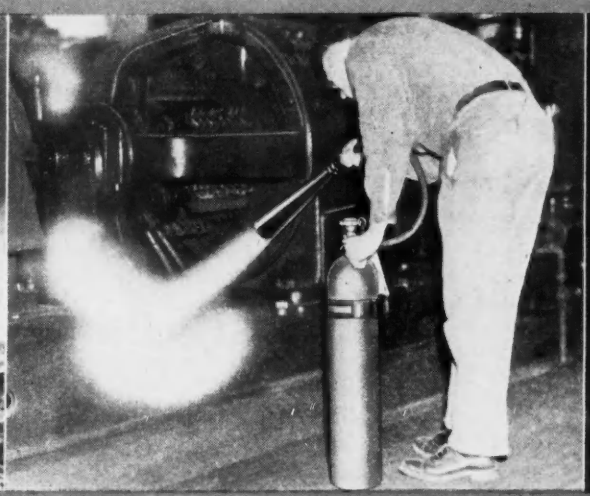
Annual recharging is not necessary as the contents do not deteriorate.

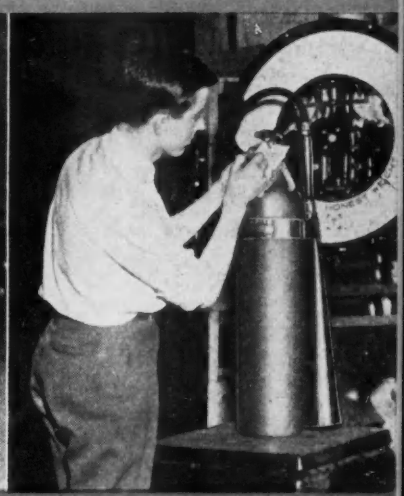
Caution: This type extinguisher should not be used on class "A" fires (wood, trash, etc.) as they leave glowing embers. Water or other approved liquids are the best extinguishing agent for class "A" fires.

For fires in small open containers of flammable liquids, approach as closely as possible from windward side, and rest discharge horn on edge of container. Direct gas on burning surface at base of flame.

For electrical fires, aim discharge at base of burning insulation. Caution: Maximum discharge range, eight feet.

Inspect and weigh extinguisher every three months. Recharge if weight loss is 10 percent or more below weight stamped on extinguisher. Check horn and hose for obstructions.





Foam Type

Use on class "A" fires (wood, rubbish, textiles, etc.) and class "B" fires (gasoline, oils, grease, etc.). Foam covers the fire with a blanket effect and smothers by shutting off the supply of oxygen.

To operate, grasp hose close to nozzle between thumb and index finger of right hand. Holding hose, grasp ring cap, while left hand grasps bottom. Lift extinguisher from bracket.

Carry extinguisher by ring cap in upright position to fire. Keep firm grip on nozzle. To discharge, invert extinguisher and hold by bottom handle. Hold nozzle firmly.

On class "B" fires (oil, gasoline, grease, etc.) direct foam against inside wall of container, just above the burning surface. Avoid agitation by allowing foam to drop lightly on surface. Walk around fire. If fire is on floor or wall, stand back and allow discharge to fall lightly, preventing spread of flames. On class "A" fires (wood, rubbish, cloth, etc.) discharge at base of flame and work upward.

Clean and recharge immediately after use. **Discharge and recharge annually.** Inspect thoroughly each six months. Check hose, nozzle, screen, lead stopple, cap gasket and relief holes. Keep tissue paper or other easily discharged objects over end of hose nozzle to prevent insects from obstructing. Complete tag and sign after each inspection or recharge. Replace tag when lost or damaged.

Caution: Foam extinguishers should not be used on electrical fires (class "C") as they will conduct electricity. Protect from freezing.

Direct foam just above burning surface.

Clean and recharge immediately after using.

Sign tag after each inspection or recharge.

"Opposed To A Planned Economy"

"Conservation Payment" For Strippers Explained

To The Editor—

In the September 16 issue of THE OIL WEEKLY the National Oil Conservation Committee was inferentially accused (in an article titled "Subsidies Invite Federal Control?"—Editor) of advocating a program inviting bureaucracy, price control, and government control; all of which constitutes a total misunderstanding of our aims. It was furthermore suggested that a cleavage is being driven into the oil industry dividing it into two factions, the lesser of which is demanding a "handout." Although the policies of the National Oil Conservation Committee have been laid out to your office by letter and to the industry as a whole by thousands of letters, circulars, and booklets, it seems necessary to re-emphasize our objectives. In order to clarify any questions about the policies and objectives of this committee, we beg to submit the following statements of fact for your consideration:

1. We are flatly opposed to subsidies as such. A conservation payment should be paid to recover oil for the good of the majority and not by subsidization to keep in business a minority.

Oppose Federal Control

2. The National Oil Conservation Committee also wants to go on record as being flatly and diametrically opposed to "a planned economy, bureaucracy, arbitrary price determination, and having unsympathic non oil men run their business." A careful study of our program would show that we are trying to prevent just that. If the industry meets conservation requirements on its own initiative, there can be no excuse for "government paternalism." We are trying to encourage that initiative.

3. Our plan does not invite bureaucracy of government control as is indicated by our resolution before the Interstate Oil Compact Commission when we requested a conservation law to be passed by Congress including conservation payment for stripper wells and *to be administered solely by the state conservation bodies. We specifically contend that all control of the oil and gas industry should remain with the states through the able administration of the Interstate Oil Compact Commission.* We might add the comment that the conservation practices of the state regulatory bodies though once vigorously opposed by a great many oil men is now regarded as its very foundation. You will find few, if any, who desire a return to indiscriminate drilling, gas waste, excessive rates of withdrawal, and other wasteful practices too legion to mention though now recognized and appreciated by every well-informed oil man.

Any suggestions that the industry is sharply divided and necessarily lined up on this program is questionable. Thousands of letters from all phases of the industry from the "majors" down to the small stripper operator indicate both a great deal of support for us, and a willingness upon those who remain unconvinced, not to oppose us openly—perhaps in the interest of industry cooperation. One and only one small new oil organization has come out to oppose this program. Many others are actively supporting us.

We not only oppose government control but sincerely believe the responsibility for an adequate oil supply to rest squarely upon the shoulders of the oil industry. Failure to recognize this responsibility and to meet it will result in some form of government control. That is perfectly obvious for if our supply is not assured by the industry alone on one hand, or under government supervision on the other, our leaders could easily be accused of dereliction of duty. Our oil supply has to be insured. Hundreds of oil operators recognize our responsibilities and are eager to do their part. Failure to recognize this responsibility would in our opinion result in government control.

An honest difference of opinion is usually a healthy sign since it insures that freedom of expression so necessary to our Democratic way of life; however, at a time when we are just emerging from government controls which caused widespread dislocations in the oil industry, those holding positions of influence in the industry should strive to avoid disunity which would serve only to jeopardize the best interest of the oil operators. Any discussions of policy should be confined to facts and should not be discolored by questionable insinuations or journalistic slanting. No worthwhile purpose can be served by resorting to name-calling at a time when the industry should be striving for unity. Industry unity has been one of the principal objectives of this committee. You have pointed out the results of discord among the various interests within the oil industry in the past. We should try to avoid those same pitfalls.

Preserving Stripper Reserves

Every economically informed man in or out of the industry recognizes the necessity for preserving our stripper well reserves. A child can understand that. Those who have a better plan to offer—should offer it. None has been brought to light to date. A callous disregard for this necessity for the conservation of stripper reserves would be a repetition of the "public be damned" policy which brought the oil industry into disrepute. The oil industry through this policy acquired a public reputation for nefarious monopolistic practices and high-pressure political log rolling. A return to these policies would undo all the good will—slowly built up by self-initiated practices of restraint and the employment of expensive public relations programs. The National Oil Conservation Committee has striven to employ good sound industry public relations practices in its drive to win the public to our program. We are attempting to show the public that the oil industry is not a selfish big business ogre existing at the expense of the public, but is a true public servant capable, if not hampered by government regulations and control, of supplying the nations needs in peace or war. It is difficult to present a cooperative front to the government or to the people if we must maliciously bicker on the motives of such unselfish efforts as ours. The National Oil Conservation Committee has purposely headed itself by individuals who do not stand to profit, except in a very limited way, by the enactment of a stripper well conservation payment law. In order to completely clarify our stand, we offer our concise industry program as published in the current quarterly bulletin of the Interstate Oil Compact Commission which reads as follows:

Program Cited

"In order to insure our country's petroleum needs against all peace or war demands, we must utilize all the known conservation practices in an extensive program including research, unitization, proper rates of withdrawal (proration), proper well spacing, fullest application of secondary recovery methods, proper above ground storage, recycling, *and the continued production of stripper wells until an absolute economic maximum recovery of oil is effected from the sand.*

"Our recommendation is four-fold:

"1. Maximum recovery of oil (conservation).

"2. Extensive exploration.

"3. Increased research.

"4. Adequate return per barrel to insure application of 1, 2, and 3. (This includes a price differential between flush and stripper production met by conservation payments.)

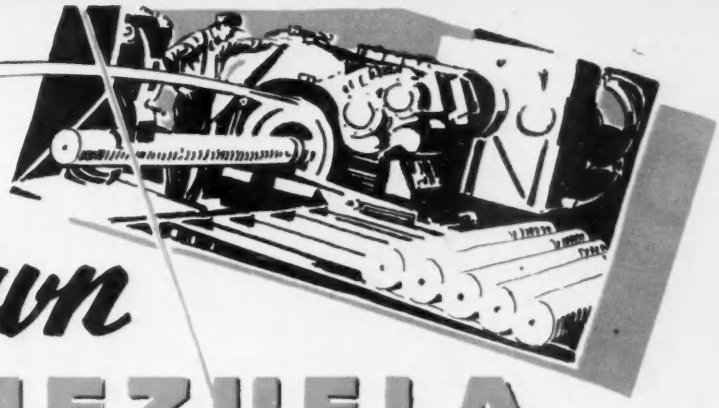
"Such a program protected by an equitable excise tax on imported oil will enable the American petroleum industry to continue to lead the world under the American system of free enterprise. If the industry does not accept this program, the trend toward a government-controlled economy that has swept the world these past two decades will engulf the American petroleum industry, depriving it of the virility and initiative that is responsible for its present greatness."

ERNEST SHAMBLIN,
Executive Manager,
National Oil Conservation Committee
Bristow, Okla.

☆ ☆ ☆

New Mexico Trip

More than 120 geologists attended a three-day field trip during September to inspect geological formations, a helium-treating plant and the Barker Creek dome in New Mexico. Sponsored by the New Mexico School of Mines and the New Mexico Bureau of Mines and Mineral Resources, the group was headed by Georges Vorbe and Ralph Wilpolt, department of geology, School of Mines, and Robert L. Bates, oil and gas division, State Bureau of Mines and Mineral Resources.



Youngstown to VENEZUELA

FOR nearly thirty years, Venezuela has been one of the world's important oil producing regions. Today the eastern shore of Lake Maracaibo alone has a potential 75% greater than the average daily production of East Texas. Outside the United States, the proven reserves of Western Venezuela are surpassed only by the Kirkuk fields of the Persian Gulf.

Since the first discoveries in the Mene Grande and Cabimas areas back in 1913-14, the Venezuelan petroleum industry has called on Youngstown for millions of feet of drill pipe, casing, tubing, line pipe.

With producers in Venezuela, as in domestic fields, the name Youngstown is synonymous with quality and good service. Because of the transportation difficulties involved in reaching this far distant point, the operator must be assured that only the best materials will reach the field. This is but another reason for the preference for Youngstown. Wherever there is oil, you can depend on Youngstown pipe, identified by orange bands, to help you in your job of supplying petroleum products for the world of tomorrow.

Youngstown Oil Country Tubular Goods is identified by the orange band or bands.

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

GENERAL OFFICES - YOUNGSTOWN 1, OHIO

Export Offices - 500 Fifth Avenue, New York City

Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

Pipe and Tubular Products - Sheets-Plates-Conduit-Bars-Coke Tin Plate-Electrolytic Tin Plate-Rods-Wire-Nails-Tie Plates and Spikes.

Cooperative Salt System Serves

Before the water reaches the 2000-barrel settling pit, it is aerated and treated with chemicals, allowing removal of solids in the settling pit. Baffles retain the precipitates in the upper section of the pit, only clear water reaching the lower end.

A COOPERATIVE salt water disposal plant recently placed in service in the Erath field of Vermilion Parish, Louisiana, features neatness, compactness, efficient oil separation and facilities for handling overflow emergencies.

The plant is operated by The Texas Company, with Phillips Petroleum Company, Humble Oil & Refininfi Company, and Tide Water Associated Oil Company, Humble Oil & Refining Company, salt water disposal now permits riddance of all water produced in the field by the participating companies by means of a single disposal well, and although the volume handled at present is small, provisions are made for accommodating larger amounts as salt water production increases.

Adopting a general disposal pattern that is similar to one used in the East Texas field, construction of the project, which began in November of last year, was complicated by unusually severe weather accompanied by frequent rains, and also by soil difficulties which varied widely from those existing in East Texas. Low elevation of the terrain above sea level results in a normal water level only four to five feet below the surface of the ground during dry periods, while in wet weather the level stands almost at the surface. Due to this condition, all excavations tended to fill with water constantly, requiring almost continual pumping. In addition, precautions were necessary to prevent floating of all buried tanks, including the concrete pits which have special tie-downs to secure in position.

6000-Barrel Capacity

Capacity of the disposal system in its present form is about 6000 barrels of salt water daily, although it handles only 1000 barrels now. The plant consists of three concrete pits, including a small gathering pit, a settling pit, and a reserve pit, with adequate facilities to remove oil and gas,, filter, and treat chemically and by aeration all water before it is returned underground. Provisions are made to direct oil into a small burning pit; in case of failure of any unit in the system, all overflow goes into the reserve pit from where it may be re-routed through all or any part of the system.

All pipe lines in the disposal system, with the exception of those leading to the burning pit, are made of non-corrosive materials, asbestos couplings being used throughout, and with cement-lined tubing used in the injection well. Due to the high temperatures likely to be encountered, ordinary steel pipe is used to conduct salvaged oil to the burning pit.

Each oil producer connected with the disposal program at Erath employs a gathering system to conduct the water to the site of the disposal plant. In the future, however, as a plan to further the scope of cooperative disposal and in particular to save pipe, common conduits for all producers will be utilized, with water lines from each lease tying into the main line at the nearest point, eliminating the present need for parallel gathering lines for each operator.

Degasser

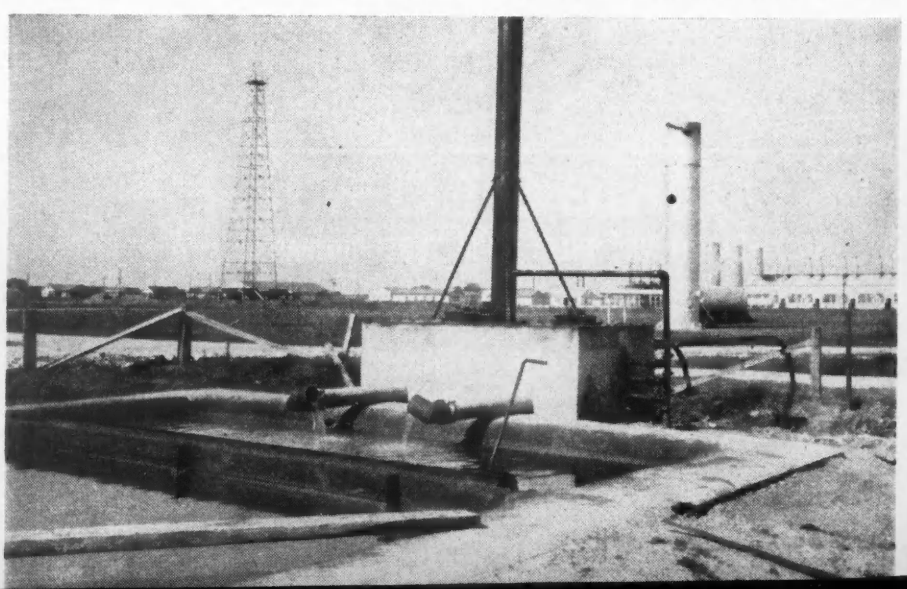
Salt water is first directed into a rectangular concrete box which serves as a degasser and which also separates part of the oil that may accompany the water. The fluid enters one side of the box, which is divided into two parts by a baffle extending the length of the tank. Liquids flow under the baffle to reach the second compartment, with considerable portions of oil being trapped in the first section. A two-inch line extends from this portion of the box to a small pit located nearby, and the accumulated oil is drained from the surface of the fluid and conducted into the pit where it is burned.

Through the steel plate cover on the box, a flume made of large-diameter pipe is erected to furnish an outlet for gas which separates from the liquids in the box. The pipe is approximately ten feet tall and effectively removes the gas from the area as a means of reducing fire hazard. Water reaching the second chamber in the separating box drains through two pipes of large diameter and passes into the upper end of the gathering pit.

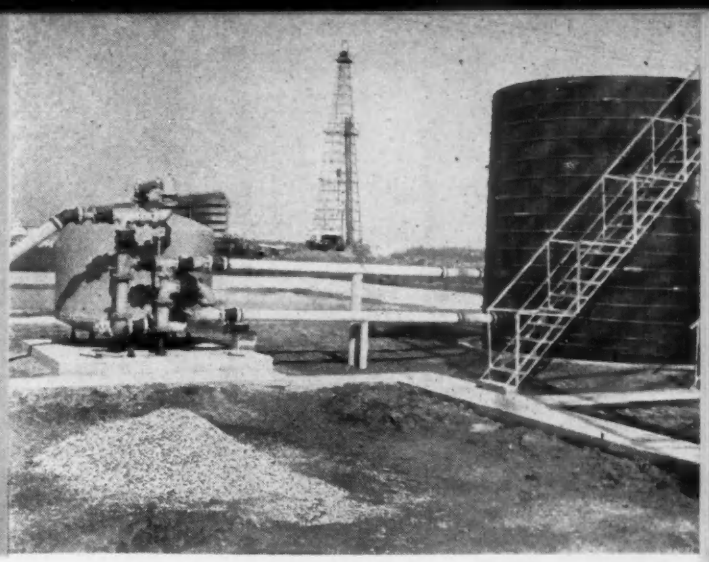
The concrete gathering pit is separated into three sections of equal size by a pair of baffles which control movement of fluids by allowing flow only beneath the baffles. Oil remaining in the water after its first separation in the separation box collects on the surface of the water in the first section of the gathering pit, while clear water moves under the baffle and into the second section. A skimmer is provided in the first section, consisting of a joint of 6-inch pipe about 12 feet long, with a longitudinal section of wall removed. The pipe is placed in horizontal position at the fluid level, with both ends supported to hold in place. A short lever is attached to the pipe near one end to permit rotating manually. When the open face of the pipe is turned slightly below the fluid level, oil flows into the chamber from the surface of the fluid, and drains from its lower end and through a two-inch line leading to the burning pit. By manual adjustments of the skimmer, oil is periodically removed in this manner.

Water flowing under the baffle enters

All water produced by the four participating oil companies at Erath is conducted into a rectangular concrete box divided into two sections by a baffle. Oil accumulates on the surface in one section, and is drained and carried to a burning pit. Gas is removed through a tall flume to reduce fire hazard.



Water Disposal Erath Operators



Water is pumped through a filter containing sand and gravel, and then goes into the clear-water tank. Backwashing of the filter is effected by gravitation, the wash water passing through the filter and into the reserve pit from where it is later redirected through the system.

the second compartment of the gathering pit, and then under a similar baffle into the third compartment, by which time it is relatively free of oil and ready for further processing. In the third pit, a float control is located for automatically starting an electric centrifugal pump which removes the water from the gathering pit and into the top of a tall wooden tank.

The electric pump is located near the lower end of the gathering pit in a small house equipped with a roof and corrugated iron sides, and sets on concrete flooring. Fed by a four-inch pipe from the gathering pit, the pump begins operating when the water rises to a predetermined level, at which time the position of the float in the water starts the pump action. The pump is automatically cut off when the water level falls.

Water is pumped into a wooden tank about 16 feet tall, constructed on the same principle as an ordinary gunbarrel to effect further and final removal of oil from the water. Tank diameter is nine feet, and in its center is located a circular wooden tank with five-foot diameter, which is placed in such manner that its open bottom is approximately one foot off bottom of the larger tank, in this way serving as a circular baffle.

Water from the gathering pit is pumped directly into the center section of the wooden tank, being conducted through a four-inch line, with water passing under the bottom of the baffle and into the annulus between the two tanks. Oil which accumulates in the top of the inside chamber drains through a two-inch line which leads to the burning pit, while clear water from the annular space flows through a four-inch pipe toward the settling pit for additional treatment. An outlet is provided in the annulus to accommodate overflow in emergencies, this drain conducting excess water into the reserve pit.

Water from the gunbarrel annulus flows by gravitation to the top of a tower where it is exposed to the air to allow formation of precipitates. From the bottom of the aerating tower, the water then gravitates through a concrete ditch to the settling pit, receiving chemical treatment during its passage through the trough, including the injection of alum, lime and dry chlorine. Facilities now under construction will provide for injection of alum and lime, and of liquid chlorine, by means of mechanical hoppers and feeders. A small wooden chemical house sets astride the ditch and is equipped with containers for mixing the chemicals and properly injecting them into the ditch, to be utilized until facilities for mechanically adding the chemicals are completed.

Settling Pit

Water flows through the trough into the upper section of the concrete treating or settling pit, which is divided into three sections by means of two baffles, and has a capacity of 2000 barrels. The baffles run horizontally across the pit, reaching from a point above the maximum water level and extending to 12 inches off bottom, forcing flow to move under the baffles to progress the length of the pit. The second section is provided with a drain which conducts overflow water into the reserve pit when needed. Bulk of the sediment from the salt water collects in the first section behind the baffle, and settles to bottom, providing a filter through which water in the future passes.

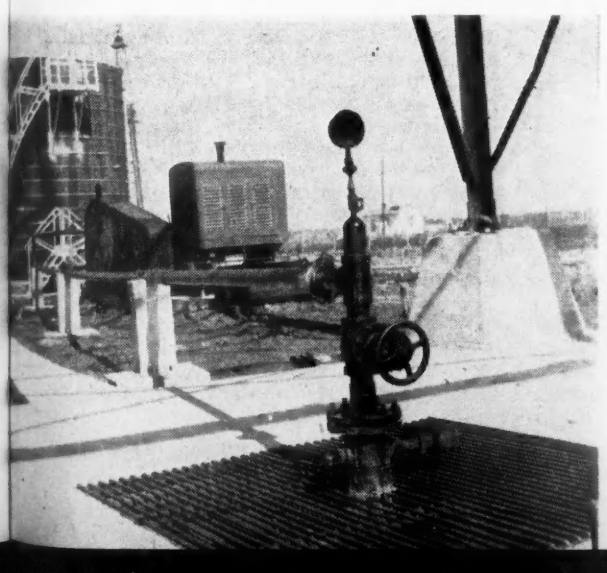
At the lower end of the settling pit, a centrifugal pump using natural gas as fuel lifts the water from the pit and transfers it under low pressure through a non-corrosive four-inch pipe to a filter containing sand and gravel, and thence into a large clear-water tank for storage prior to injection. This tank is also equipped with an overflow which conducts water to the reserve pit emergencies.

A gasoline engine driving a reciprocating pump receives water from the clear-water tank, and pumps it through a three-inch line into the tubing of the injection well which is located nearby, building up 500 pounds of pressure which are required to force the water into the formation due to tightness of the receiving sand. The well drilled for disposal is the Broussard C-1 salt water disposal well, and was completed in 200 feet of sand found at a depth of 2500 to 2700 feet. Seven-inch casing was set to the top of the sand, and the bottom 200 feet were under-reamed to a diameter of 16 inches for gravel packing. Cement-lined, corrosion resistant tubing 3½ inches in outside diameter is used in the injection well, and it extends down to 2200 feet where it sets on a lead seal above a liner packer and 4½-inch slotted liner which extends to bottom.

Provisions are made for backwashing the filter by gravity, with six-inch non-corrosive pipe running from the clear-water tank to the lower section of the filter. Weight of the hydrostatic head of fluid in the tank is sufficient to produce pressure needed for reverse circulation of water through the filter, and a line conducts the wash water to the reserve pit.

The reserve pit, also made of concrete, has a capacity of 5000 barrels of water, and accommodates all overflow in event of failure of any apparatus in the treating system. A pump is being installed to pick up water from the pit for return through the disposal system.

All-weather convenience is provided by concrete sidewalks extending through the disposal plant area to permit access by operating personnel and relief from the muddy conditions which often exist in Gulf Coast sections. Its appearance is enhanced by terracing the sides of the main pits and planting grass through the area.



A pump driven by a gasoline engine develops the 500-pound pressure required to force water into the receiving sand, removing it from the clear-water tank and into the cement-lined tubing of the injection well. The receiving formation is found from 2500 to 2700 feet, and is tightly packed.

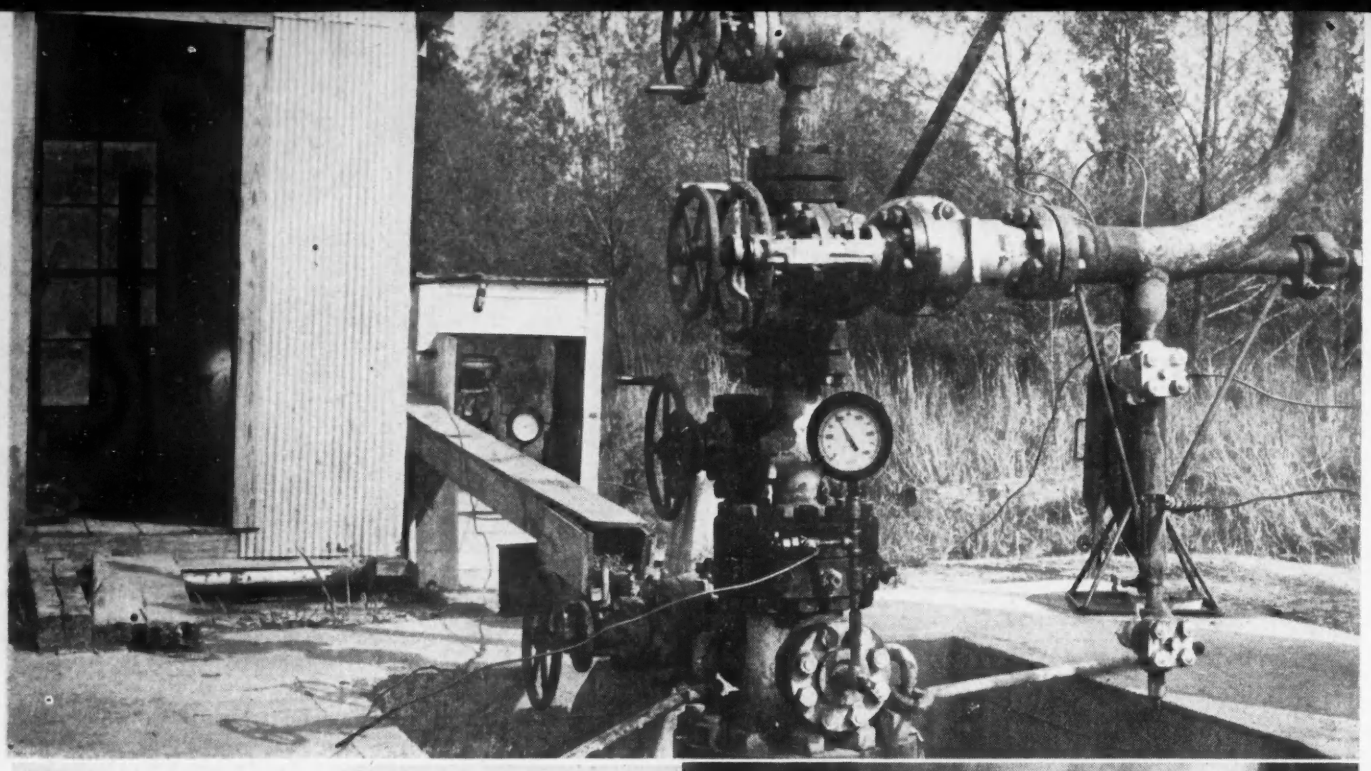


Figure 9 (above). Inhibitor injecting equipment assembled for winter operations in the Cotton Valley field, Louisiana.

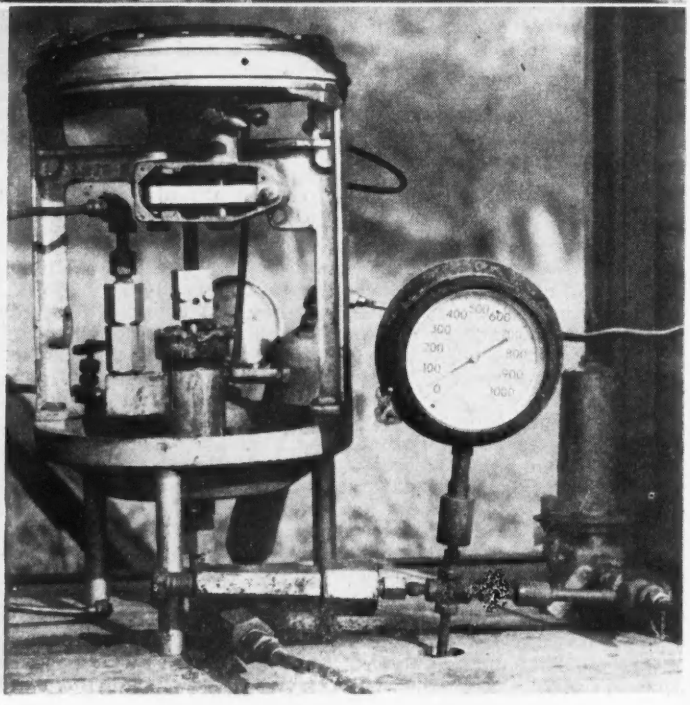


Figure 10 (right). Experimental pump designed for high-pressure injection service; actuated by expanding gas from the well.

Part 2

Sodium Chromate

As a Corrosion Inhibitor in Gas-Condensate Wells

By C. K. EILERTS, H. A. CARLSON, R. V. SMITH, F. G. ARCHER and V. L. BARR

THE wells in the Cotton Valley field, Webster Parish, Louisiana, that are subject to corrosion have usually been affected in the Christmas tree fittings and in the upper 1000 feet of the tubing. The injection tests now in progress in this field were begun on October 12, 1945, on a well producing from a formation under a pressure of 2930 pounds per square inch and a temperature of 238° F.

The equipment used for the first four weeks of the test to inject sodium chromate solution into the well was the same as that shown in Figure 7 (see THE OIL WEEKLY of September 30). On November 9 an especially designed, diaphragm-motor-driven pump and other equipment were installed. Figure 9 shows the equipment assembled at the well for cold-weather operations. The 60-gallon solution storage tank for operation under a pressure of 40 to 70 pounds per square inch is shown just inside the door of the corrugated-iron building. A gas-fired heater was provided for this building and copper tubing lines from the tank to the pump and from the pump to the casinghead were insulated with sawdust to minimize freezing.

As shown in Figure 9, the flow line from the Christmas tree has a welded-on trap for collecting water samples and a welded-on nipple fitted with a coupling and plug by means of which coupons may be introduced into the flow stream to measure its corrosiveness. A similar opening to the flowstream was provided on the "meter loop" about 12 feet downstream from the first coupon location. The first coupon, numbered "1" in Figures 11, 13 and 14 of this report, was located only a few inches from the flow control valve and in a turbulent fluid stream. The second cou-

The accompanying article was presented as a paper before the Natural Gasoline Association of America annual meeting, Dallas, Texas, April 17, 1946. It is published by permission of the director of the U. S. Bureau of Mines, U. S. Department of Interior. Part 1 appeared in The Oil Weekly of September 30.

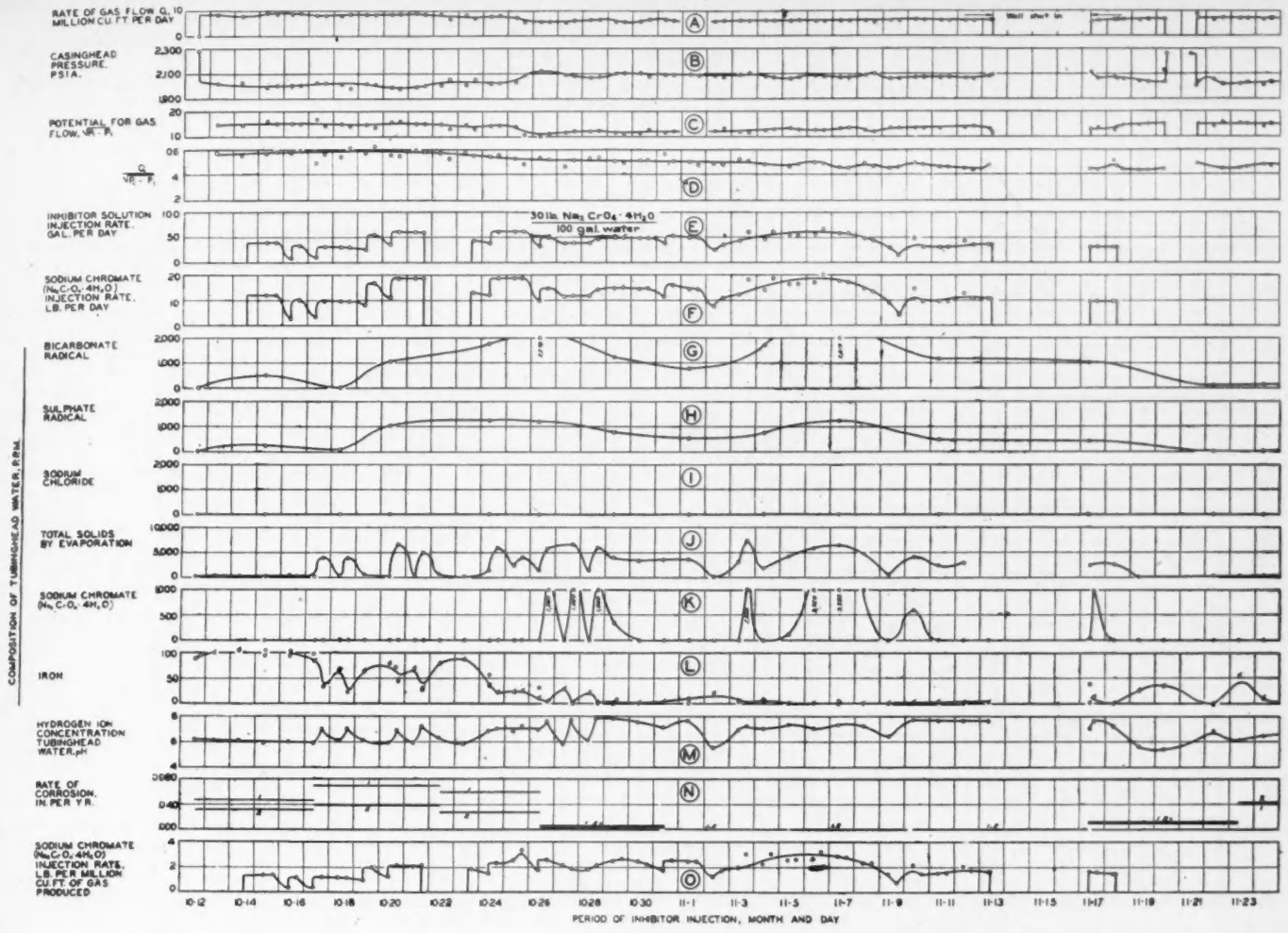


Figure 11. Results obtained by the injection of sodium chromate solutions into the flow stream of a gas-condensate well subject to corrosion. Cotton Valley field, Webster Parish, Louisiana, 1945.

pon, numbered "2" in Figures 11, 13 and 14, was inserted in the flow stream at the opening where fluid samples are taken and where more nearly viscous flow prevails. The coupons of low-carbon, hot-finished, 16 gauge sheet steel 1 inch by 4 inches in size were exposed for approximately seven-day periods.

The diaphragm-motor-driven pump shown in Figure 10 was especially constructed by Black, Sivalls & Bryson, Inc,. for high-pressure service. It delivers an average of 80 gallons of aqueous solution per day against a casinghead pressure of 2000 pounds per square inch under normal conditions of operation. Two inlet and two outlet valves are fitted with stainless steel cones and seats that can be replaced readily in the field and refinished elsewhere in an accurate lathe. The pump functioned well but could not always be operated continuously on winter days because of stoppage of the gas lines with hydrates and freezing of the solution lines from the tank to the well.

The results for the first 44 days of the test in the Cotton Valley field are shown in Figure 11. At the beginning of the test, the concentration of iron in the effluent water was 100 parts per million, and the rates of corrosion of the coupons averaged 0.045 inch per year. After 16 days of treatment, when the injection of sodium chromate was at the rate of approximately 2 pounds per million cubic feet of gas, iron in the effluent water decreased to an average of 8ppm, and rates of corrosion of the coupons averaged 0.001,1 ipy. Values of these measures of the corrosion control provided by sodium chromate increased when injections were interrupted on November 18.

Nature of the Tubing Obstruction

The tubing flow-capacity factor (Section D) decreased as the cumulative weight of injected sodium chromate increased, indicating the formation of an obstruction in the tubing. Two explanations of the obstruction seem plausible. One is that the sodium chromate was reduced by certain hydrocarbons in the flowing fluid to form a blue-green solid essentially chromic hydroxide, $Cr(OH)_3$, insoluble in water and tending to deposit on the tubing walls. Samples of the solid in a powdered state were taken from the water trap at the tubinghead of the well and analyzed. The analyses showed that 97.4 percent of the material was soluble in 15 percent hydrochloric acid and that it contained 1.6 percent iron, 95.2 percent reduced chromium compounds, and only traces of sulfides and carbonates. The inspection of tubing from other wells where chromium compounds have been used has disclosed that this water-insoluble material can accumulate in the flowstring and form compact masses. As will be described, however, it is possible to remove the obstruction by flowing the well and injecting only water.

A second explanation of the formation of an obstruction in the flowstring is that gas entering the well from the formation may be undersaturated with water. Inhibitor solution entering the flowstream at the tubing entrance therefore would be evaporated, and a deposit of solid sodium chromate would be left in the lower end of the tubing. The original reservoir pressure at the Cotton Valley test well was estimated to be 4015 pounds per square inch absolute, while in November, 1945, the estimated bottom-hole pressure with the well flowing was 2825 pounds per square inch absolute. Figure 12 shows that, for a methane-water system in equilibrium, the water contents at the two pressures and 238° F. would be 57 and 72 gallons per million cubic feet of gas, respectively. The drop in pressure of 1190 pounds per square inch at constant temperature is accompanied by undersaturation of the gas as to water in the amount of 15 gallons per million cubic feet produced. Granting that liquid water in remote parts of the formation will tend to resaturate the gas as the pressure declines there is, nevertheless, a drop in pressure as the gas flows toward the well, and liquid water in the drainage area immediately about the well will soon be removed so that, eventually, expanding gas flowing toward the well cannot pick up water. Tests[6] have shown that the gas from a newly developed reservoir, where the formation pressure had not declined, was saturated at the entrance of the tubing and that condensation of water in the tubing increased progressively as the gas moved toward the surface and the temperature

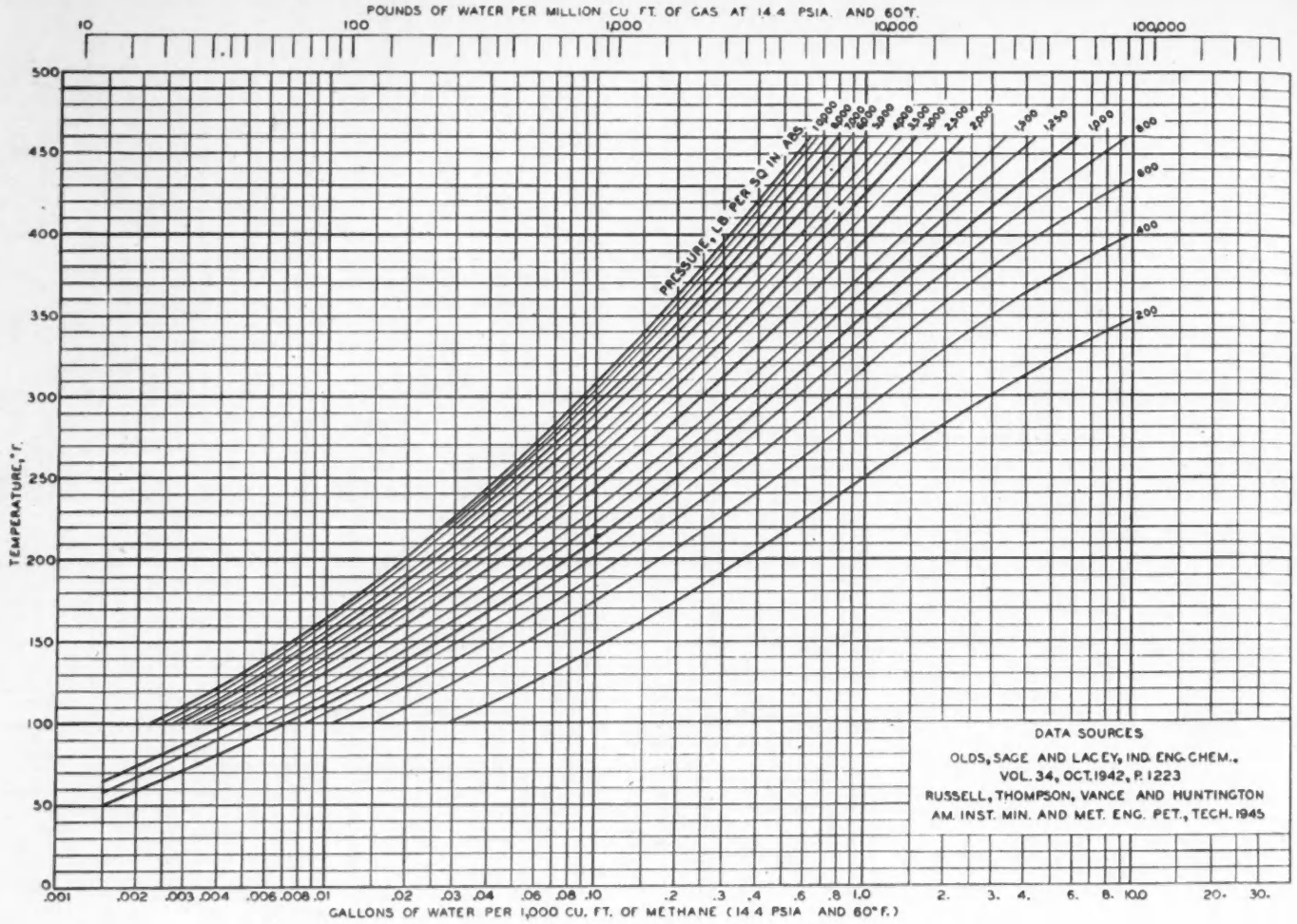

POUNDS OF WATER PER MILLION CU. FT. OF GAS AT 14.4 PSIA. AND 60°F.
10
100
1,000
10,000
100,000
TEMPERATURE, °F.
PRESSURE, LB. PER SQ. IN. ABS.
DATA SOURCES
OLDS, SAGE AND LACEY, IND. ENG. CHEM., VOL. 34, OCT. 1942, P. 1223
RUSSELL, THOMPSON, VANCE AND HUNTINGTON AM. INST. MIN. AND MET. ENG. PET., TECH. 1945
GALLONS OF WATER PER 1,000 CU. FT. OF METHANE (14.4 PSIA AND 60°F.)

Figure 12. Composition of dew-point gas in methane-water and natural gas-water systems.

decreased. In such wells evaporation of an inhibitor solution in the tubing would not be expected.

In these tests the injecting pump was operated at its maximum capacity to provide the greatest possible amount of water for carrying sodium chromate up the tubing in solution and for washing solid reduced-chromium compounds to the surface as rapidly as they are formed. Freezing weather prevented effectual operation of the pump during the winter months, and it was April before improvements in the pump mechanism and continuous warm weather permitted attainment of the pump capacity of 80 gallons per day.

The injection of 1.5 to 2.1 pounds of sodium chromate per million cubic feet of gas produced from November 25 to December 19 (Figure 13) lowered rates of coupon corrosion to 0.0006 ipy, and the concentration of iron in effluent water to 1 ppm. At the same time, however, the flow of gas from the well decreased from 7 to 5 million cubic feet per day, and the flow capacity factor decreased from 0.45 to 0.28. Beginning on December 28, water only was injected into the well in an attempt to wash the obstruction out of the tubing and by February 3 (Figure 14) the well was flowing 8 million cubic feet of gas per day and the flow-capacity factor had increased to 0.51. Rates of injection of water were low during most of the cleanout period and erosion of the deposit by fluid movement through the tubing may have contributed to its removal.

On December 27 a subsurface instrument was lowered into the tubing, and the top of the obstruction was located at 8369 feet, or 101 feet above the lower end of the tubing. On January 25 the top of the obstruction was at a depth of 8454 feet, only 16 feet above the bottom of the tubing, so that 14 feet of tubing perforations above the obstruction were fully exposed. With reference to Figure 13, Sections A and D, it is evident from recovery of the tubing flow-capacity that most of the obstruction had been removed by January 14 after 18 days of washing. Over the entire period of washing, rates of coupon corrosion averaged 0.0139 ipy, and iron in the tubing head water averaged 27 ppm as compared with 0.045 ipy and 100 ppm, respectively, measured at the beginning of the injection tests. Although sodium chromate was not present in the effluent water in measurable quantities during the washing period, it is believed that sodium chromate, which constituted a part of the obstruction in the tubing, was effective in maintaining corrosion in the flow string at relatively low rates while the obstruction was being dissolved or otherwise removed.

On February 3 modifications were completed in the equipment to provide for greater injection capacity, and treatment of the well with sodium chromate was continued. The concentration of the sodium chromate solution was lowered from 30 to 20 pounds per 100 gallons of water to determine if less sodium chromate with each million cubic feet of gas produced would provide adequate corrosion protection and not result in the formation of an obstruction in the tubing. The volume of aqueous solution injected each day was maintained as large as possible.

Coupons removed from the tubinghead on February 12 showed high rates of corrosion, but no explanation for this exceptional result has been found. Concentrations of iron in the effluent water were not abnormal during this test interval, and the coupons subsequently exposed showed an average corrosion rate of 0.0114 ipy as compared with 0.045 ipy measured at the well before sodium chromate was injected. The concentration of iron in the effluent water during this period (February 12 to March 10) averaged 8 ppm.

On February 3, when the injection of the solution containing 20 pounds of sodium chromate per 100 gallons of water was begun, the rate of flow from the well was 8½ million cubic feet per day and the flow capacity factor was 0.50. On March 10, when the test was completed, the flow rate was 6.4 million cubic feet of gas per day and the flow capacity factor was 0.34. It was evident that an obstruction was slowly forming in the tubing; casinghead pressures, however, increased as the test proceeded, indicating that there was no deposit in the casing perforations. When water only was injected into the casinghead from March 10 to March 20 the flow of gas was increased to 7.6 million cubic feet per day and the flow-capacity factor for the tubing was increased to 0.40. This substantial recovery in the flow capacity of the tubing with ten days of washing with water was accompanied by rates of coupon corrosion averaging

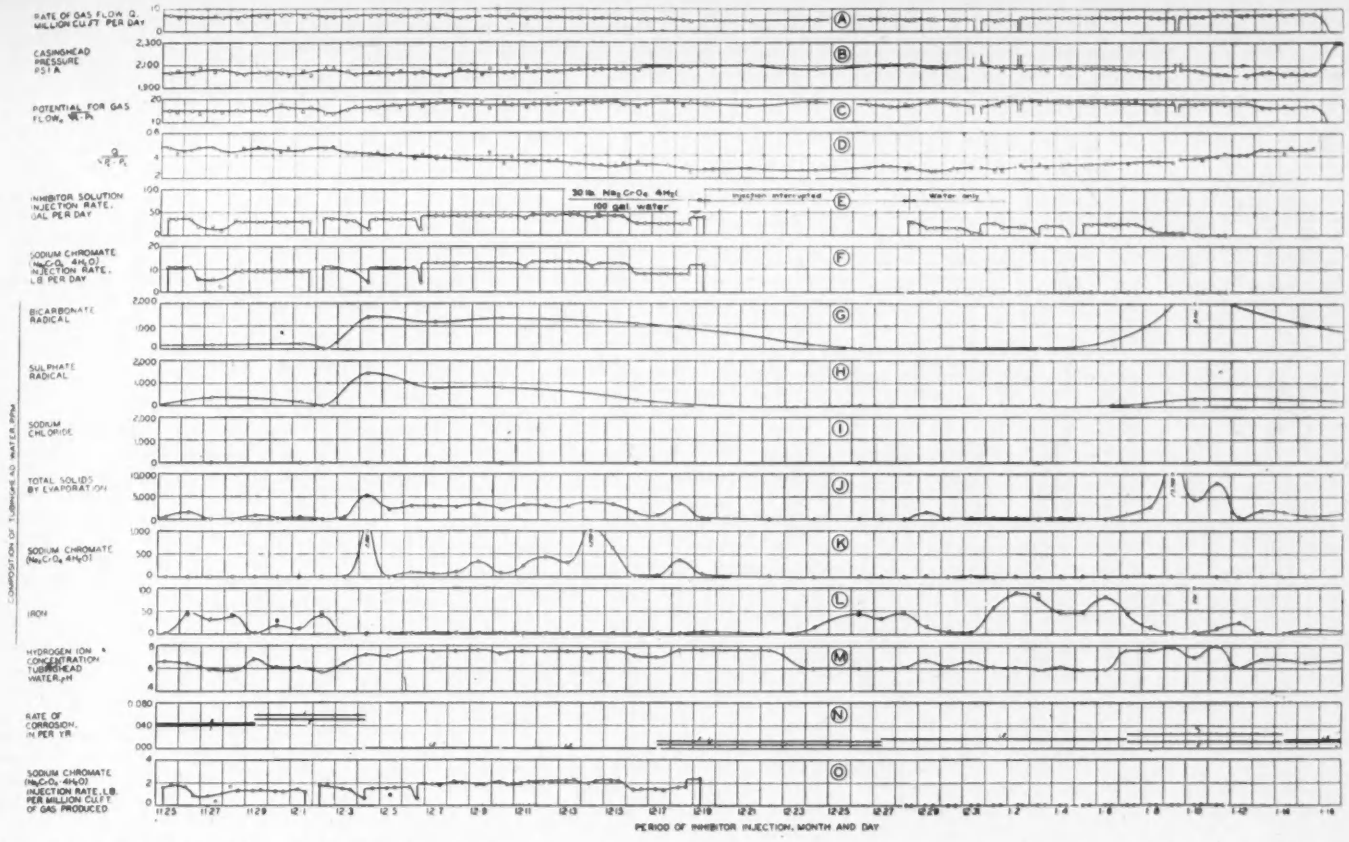

RATE OF GAS FLOW Q, MILLION CU FT PER DAY
CASINGHEAD PRESSURE PSI A
POTENTIAL FOR GAS FLOW
INHIBITOR SOLUTION INJECTION RATE, GAL PER DAY
SODIUM CHROMATE INJECTION RATE, LB PER DAY
BICARBONATE RADICAL
SULPHATE RADICAL
SODIUM CHLORIDE
TOTAL SOLIDS BY EVAPORATION
SODIUM CHROMATE
IRON
HYDROGEN ION CONCENTRATION TUBINGHEAD WATER, pH
RATE OF CORROSION, IN PER YR
SODIUM CHROMATE INJECTION RATE, LB PER MILLION CU FT OF GAS PRODUCED
COMPOSITION OF TUBINGHEAD WATER, PPM
30 lb Na2CrO4 4H2O
100 gal water
injection interrupted
Water only
PERIOD OF INHIBITOR INJECTION, MONTH AND DAY

Figure 13. Results obtained by the injection of sodium chromate solutions into the flow stream of a gas-condensate well subject to corrosion, Cotton Valley field, Webster Parish, Louisiana, 1945 and 1946.

0.015 ipy and concentrations of iron in the effluent water averaging 5 ppm.

Summary of Corrosion-Control Tests at Wells

Summary of Corrosion-Control Tests in the Opelika, Texas, gas-condensate field was to determine if sodium chromate would inhibit the corrosion of steel in the well. The rate at which sodium chromate was injected was varied to determine how rates of coupon corrosion and concentration of iron in the effluent water would be affected. Tests in the Cotton Valley, Louisiana, gas-condensate field were conducted to find if sodium chromate would inhibit corrosion and to determine how to control corrosion without creating obstructions in the flow string. Experimental efforts to accomplish this second purpose required that some sacrifice be made in inhibiting corrosion while information on the nature and causes of the formation of a deposit in the tubing was being collected.

Table 3 summarizes the corrosion-control tests at wells.

In the Opelika field, sodium chromate solutions in increasing strengths were used to obtain substantially complete

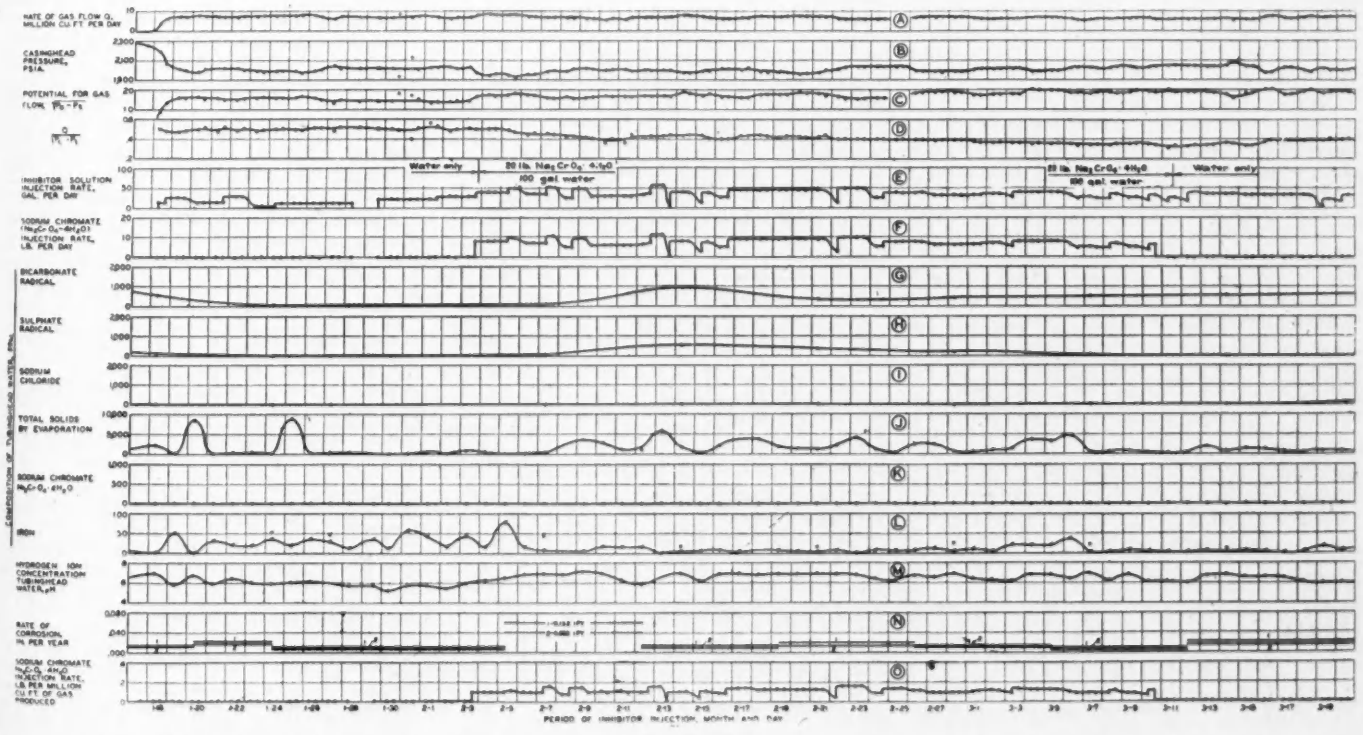

RATE OF GAS FLOW Q, MILLION CU FT PER DAY
CASINGHEAD PRESSURE, PSIA
POTENTIAL FOR GAS FLOW
INHIBITOR SOLUTION INJECTION RATE, GAL PER DAY
SODIUM CHROMATE INJECTION RATE, LB PER DAY
BICARBONATE RADICAL
SULPHATE RADICAL
SODIUM CHLORIDE
TOTAL SOLIDS BY EVAPORATION
SODIUM CHROMATE
IRON
HYDROGEN ION CONCENTRATION TUBINGHEAD WATER, pH
RATE OF CORROSION, IN PER YEAR
SODIUM CHROMATE INJECTION RATE, LB PER MILLION CU FT OF GAS PRODUCED
COMPOSITION OF TUBINGHEAD WATER, PPM
Water only
20 lb Na2CrO4 4H2O
100 gal water
PERIOD OF INHIBITOR INJECTION, MONTH AND DAY

Figure 14. Results obtained by the injection of sodium chromate solutions into the flow stream of a gas-condensate well subject to corrosion, Cotton Valley field, Webster Parish, Louisiana, 1946.

TABLE 3

Summary of Corrosion-Control Tests at Wells; Averages

1	2	3	4	5	6
		INJECTION RATE			
Test Period, Month and Day	Solution Lb. per 100 Gallons	Water, Gal. per Million Cu. Ft. Gas	Inhibitor, Lb. per Million Cu. Ft. Gas	Coupon Corrosion, ipy	Iron in Water, ppm
Tests at Opelika Well:					
Before Treatment	....	.....	.....	0.045	70
8–21 to 8–25	10	8.6	.7	.001	5
8–26 to 9–15	20	9.6	1.9	.002	3
9–23 to 10–19	30	8.4	1.8	.002	1
Tests at Cotton Valley Well					
Before Treatment	....	.....	.....	0.0045	100
10–28 to 11–13	30	7.4	2.2	.001	4
12– 4 to 12–19	30	5.9	1.7	.002	2
12–29 to 2– 3	0	2.2	.0	.014	27
2–12 to 3–10	20	5.5	1.1	.011	8
3–11 to 3–20	0	4.9	.0	.015	5

inhibition of corrosion, as indicated by the test results shown in columns 5 and 6. A solution containing 30 pounds per 100 gallons of water was used at the Cotton Valley well until December 19 to provide 1.7 pounds of sodium chromate per million cubic feet of gas produced. Rates of coupon corrosion in the Cotton Valley well were lowered to 0.002 ipy, and the concentration of iron in the effluent water became 2 ppm. An obstruction formed in the tubing while this treatment was in progress, so the well was washed with water from December 19 until February 3. Rates of coupon corrosion increased to 0.014 ipy, and the concentration of iron in the effluent water became 27 ppm, while the obstruction was being removed. The treatment beginning February 3, which was designed to decrease the rate at which an obstruction would form in the tubing, was atended by coupon corrosion at the rate of 0.011 ipy, with 8 ppm of iron in the effluent water, while the rate of withdrawal from the well decreased from 8.5 to 6.4 million cubic feet of gas per day over a 35-day injection period. The flow capacity of the tubing was subsequently restored to 7.6 million cubic feet per day with only ten days of washing, and the measures of corrosion increased to 0.015 ipy and 5 ppm of iron.

With reference to Table 3 and the tests at the well in the Cotton Valley field, the measures of corrosion while inhibitor injection and "wash" cycles were in progress show very desirable corrosion control benefits as compared with rates of corrosion that were measured at the well before sodium chromate had been injected. It is not recommended that such intermittent procedure be followed, however, and tests are in progress to find a continuous treatment that will provide corrosion control without the progressive deposition of an obstruction in the tubing. Two approaches are being followed: one, to inject more water and prevent evaporation of the inhibitor solution in the tubing, and the other, to minimize the conversion of sodium chromate to water-insoluble, reduced compounds by decreasing the hydrogen-ion concentration—increasing the pH—of the water in the tubing.

Sodium Chromate Dropped Into Tubing Against the Flow of Fluid

The discussion in the foregoing sections dealing with laboratory and field tests of sodium chromate has been confined to use of the inhibitor in aqueous solution form. However, while work in the Cotton Valley field was in progress it became evident to the bureau personnel engaged in the tests that other means of introducing the inhibitor must be devised to meet conditions in some wells. For example, if the annular space between the tubing and casing is closed with a packer or filled with mud fluid, a gas or liquid cannot be injected into the lower end of the tubing through the casinghead but must be introduced into the tubing through a "macaroni string" . . . small-diameter tubing suspended inside the flow tubing. The macaroni string must be as long as the flow string to be protected and strong enough to support its own weight but not so large in diameter that it will seriously limit the flow capacity of the well. However, solid inhibitors or treating agents may be dropped into the tubing of a well, provided sticks of the solid are of such dimensions and specific gravity that they will descend to the lower end of the tubing against the flow of the fluid.

Results obtained in treating the test well in the Cotton Valley field with sticks of sodium chromate have been reported in detail.[7] Briefly, molten sodium chromate was cast into sticks 1⅛ inch in diameter and 8 inches long, weighing approximately 0.6 pound each. The castings were coated with sodium silicate to protect them from atmospheric moisture and to decrease the rate at which the sticks would dissolve in water. On January 26, eight sticks of sodium chromate were dropped into the tubing of the well (the well was not flowing) and were heard to strike bottom in approximately 25 seconds. The well then was opened to flow and 45 minutes after the sticks were dropped the concentration of sodium chromate in the effluent water was 1200 ppm. Traces of sodium chromate were found in the water after three hours.

A wellhead magazine (lubricator) was used to hold the sticks under pressure before they were dropped into the well tubing. When the magazine was assembled, the sticks were tied together and suspended inside a brass cylinder from a releasing mechanism at the top of the lubricator. The lubricator was 2-inch-diameter steel tubing, approximately 6 feet long and of a conventional design used for introducing subsurface instruments into high-pressure wells.

On January 27, eight sticks of sodium chromate were dropped into the tubing while the well was flowing at the rate of 3.4 million cubic feet of gas a day. The sticks were heard falling for 29 seconds, but there was no indication by sound when they came to rest. Later that day eight sticks were released from the magazine while the well was flowing at the rate of 3.8 million cubic feet of gas a day, and with that volume of gas flowing, the olwest of the string of sticks apparently caught in a Christmas tree fitting and prevented the sticks from entering the tubing. There was no sound of falling sticks after they struck the fitting, and the effluent water showed a high concentration of sodium chromate immediately after the sticks were released; however, no difficulty was experienced in closing the tubinghead gate valve 30 minutes later, indicating that the sticks had dissolved in the flow stream at the Christmas tree.

The tests at the well in the Cotton Valley field proved that sticks of a corrosion-inhibiting material can be dropped into the tubing while a well is flowing. Many improvements, however, will be necessary to make the method of treatment a practical one. The wellhead magazine can be modified to simplify the method of injecting the material, and the sticks should be made longer than those used in the test so that they will be less likely to lodge in the Christmas tree when released from the magazine. Also, an obstruction can be placed in the tubing to catch and hold the sticks at a level where there is certain to be condensed water to dissolve them. The sticks should be coated or impregnated with sodium silicate or other material, so that some of the sticks will dissolve quickly and the solution of others delayed for several hours. The initial tests of this method of treating wells gave promising results, and additional development work is in progress.

Acknowledgments

The investigations of means of controlling corrosion in gas-condensate wells have been carried on by the Bureau of Mines in cooperation with the Natural Gasoline Association of America and the American Gas Association. The most helpful cooperation of T. S. Bacon, of the Lone Star Producing Company, and T. W. McGuire, of the Cotton Valley Operator's Committee, and their associates is gratefully acknowledged. The injecting pumps were furnished by Black, Sivalls & Bryson, Inc., and the interest of G. Raymond and G. O. Kimmel of that company in constructing new equipment has been particularly helpful. The information obtained by X-ray analyses on composition of some of the corrosion products was provided by F. A. Prange of Phillips Petroleum Company and D. A. Shock of The University of Texas, H. C. Hamontre, Cleo Rall, Faye Green, H. M. Harris and N. B. Mullens of the Bureau of Mines have assisted with the experimental work; and J. M. Seward, Earlene Squires, M. D. Headley, and C. R. Sponsler, also with the Bureau, have prepared the illustrations for this report. H. C. Miller and N. A. C. Smith have offered valuable suggestions in the preparation of the manuscript. The investigations were under the supervision of R. A. Cattell, Chief, Petroleum and Natural Gas Division, Bureau of Mines, and H. C. Fowler, Supervising Engineer, and C. J. Wilhelm, engineer in charge of production, Petroleum Experiment Station, Bartlesville, Okla.

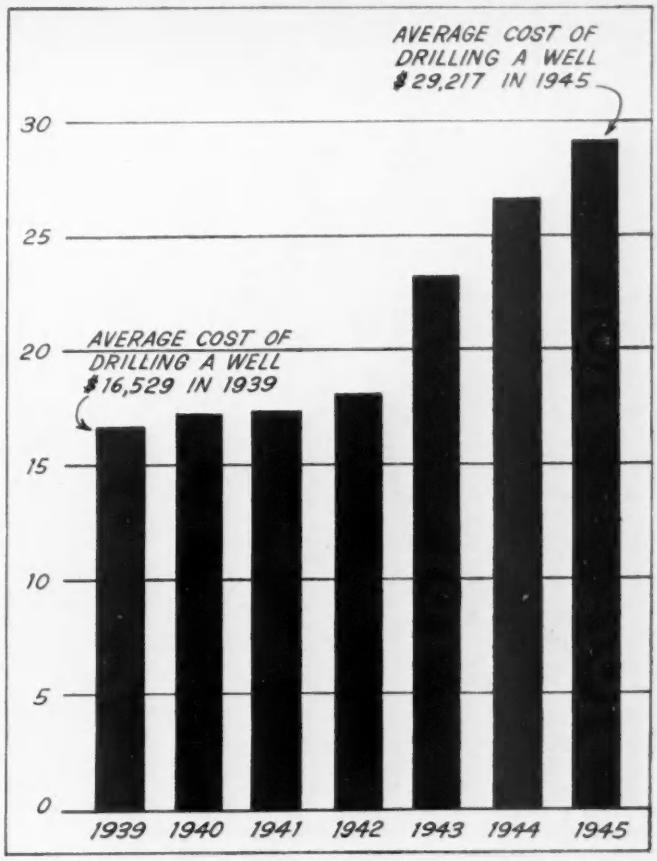
References

[6] Eilerts, C. K., Smith, R. V., and Barr, V. L., Measuring Distribution of Liquids in Flowstring of a Gas-Condensate Well, Oil and Gas Jour., December 15, 1945, p. 91.

[7] Eilerts, C. Kenneth, Sodium Chromate Effective in Combating Corrosion in Gas Wells, Oil and Gas Jour., May 18, 1946, p. 124.

Drilling Costs Up Sharply Above Prewar

Responsible factors include higher wages and salaries, more expensive equipment, shortages, less efficiency among workers, greater drilling depths, more wildcatting, and relatively more dry holes drilled



Average cost per well drilled in the U. S. (Thousands of dollars per well).

By DAVID I. SISKIND
Construction Division, Office of Domestic Commerce

UNTIL recently, little attention was paid to total capital expenditures in the crude petroleum and natural-gas drilling industry. Production and discoveries were the points of interest with costs playing a minor role.

For decades the industry has been expanding at a rapid rate. This was possible only because of its widening market and the development of new, rich sources of supply. As long as large fields continued to be brought in, the flow of new capital into the industry was assured. With the vanishing of the extensive frontier, particularly in crude petroleum, more attention is being paid to the costs of extraction.

Fields which would have been abandoned 20 years ago as sub-marginal producers are kept in production through the use of expensive input wells. The more intensive an industry becomes, the greater is the stress upon costs of production.

In the seven-year period, 1939-45, capital expenditures amounted to 3.7 billion dollars. More than three-fourths of this total represents construction expenditures. Average drilling cost per well increased 75 percent.

In this industry, collection of statistics has long been recognized as of prime importance. Emphasis has been placed primarily upon physical statistics—output, runs to stills, new producers, and reserves—and on financial operating data. One important phase, that of cost of drilling for new wells, has been sorely neglected.

Aside from the last regular Census of Mineral Industries of 1939, little attempt was made prior to 1946 to determine average cost per well and total new-capital expenditure in this industry, though approximately 75 percent of the total lifetime cost of a well is incurred prior to production.

Costs per well vary widely in different areas and costs of some wildcats are over the $250,000 mark. Extremes in costs are to be found in many industries, but these variations are more pronounced in this industry because of the multitude of different geologic and topographic factors involved. Nevertheless, as the industry recently discovered when requesting an increase in the price of crude petroleum average costs are an important factor, and lack of cost data a serious handicap. Careful consideration and study of the factors determining average cost per well will give a fairly good indication of the trend of costs.

Estimating Costs Difficult

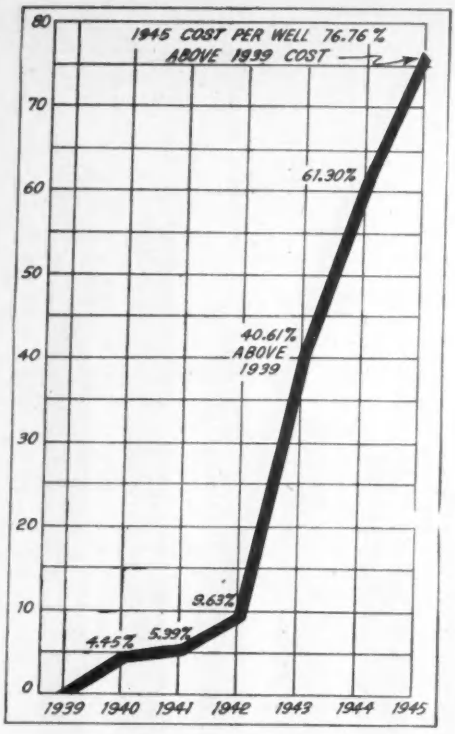
Any attempt to estimate costs and expenditures in so individual and widespread an industry presents many difficulties. Numerous expenses are involved, both tangible and intangible, which may or may not be included under costs. Some of the intangibles can be estimated and prorated; other important costs by their very nature cannot be included. Defining the items included and carefully indicating those which are excluded is an absolute necessity.

The primary source of information for expenditures in this industry is the Crude Petroleum and Natural Gas Section of the 1939 Census of Mineral Industries, which is based upon returns from 27,550 wells drilled in 22 states. Basic data are limited to the construction and equipment costs covered by the Census survey, such as casing, flowing and pumping equipment, derricks, wages and salaries, fuel, energy, contractors' profits, depreciation.

Exploratory costs—an increasingly important item—was omitted as it did not enter into actual drilling expenses. The OPA Petroleum Advisory Committee indicated that this cost varied in amount from roughly one-fourth to one-third of the expenditures incurred in drilling and that this cost will become greater as the proven areas decrease. The total exploratory cost is unavailable; moreover, it would not be practical to attempt to prorate these costs among individual fields or wells.

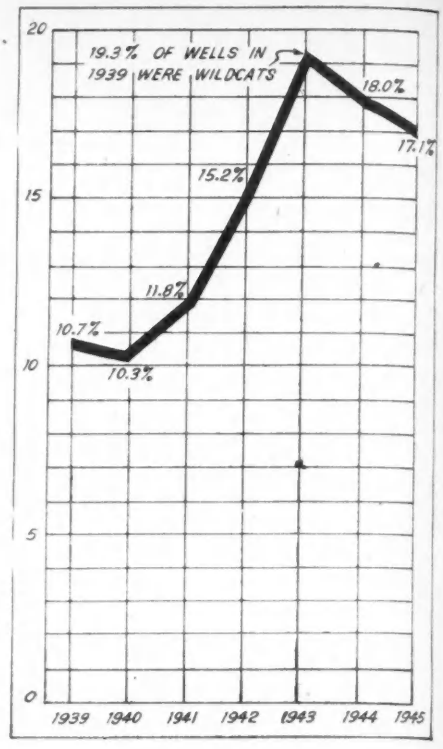
In this article costs are based upon the average Census costs by state for oil and gas wells and dry holes. Costs

Originally published by U. S. Department of Commerce in its publication, Domestic Commerce, August, 1946, under the title, "Capital Expenditures in the Oil Well Drilling Industry." Charts herewith published were prepared by The OIL WEEKLY from data in the article.



Percent increase over 1939 in average cost per well drilled in the U. S.

Number of wildcats shown as percent of total wells drilled in U. S.



for input wells were determined by the Census Bureau only for Pennsylvania and New York where they account for a large portion of the drilling. In those states the cost of an input well was found to be approximately 80 percent of the cost of a petroleum-producing well.

In the crude-petroleum industry the cost of these input wells are as much a part of the capital expenditures of the industry as the output wells. This type of well is becoming more important in the older fields where artificial methods of extraction, in addition to pumping, are necessary. Therefore, expenditures on input wells were included at a ratio of 80 percent of the cost of the oil producers in each state. Salt-water disposal wells were treated in the same manner.

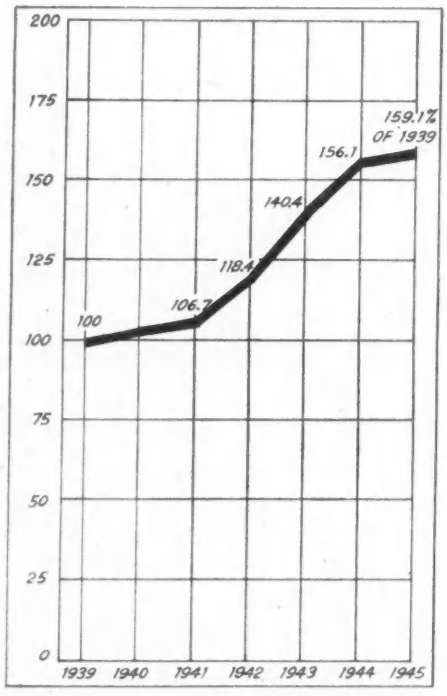
A capital expenditure of minor importance excluded by the Census survey pertains to the deepening of existing wells. This cost was arrived at by multiplying the length of the extension by average cost per foot in each state. The 1939 total expenditure per state was merely average cost for each type of well in the state—oil, gas, dry, distillate, input, disposal—multiplied by the number of such wells, plus the additional expenses of deepening existing wells. The 1939 Census average costs were used as the base for determining expenditures for later years.

Labor-Equipment Costs Rise

Starting in 1940, costs began to rise and the average cost per well increased steadily. Wage-labor costs which account for a sizeable portion of expenses remained virtually constant in 1940 but started moving upward in 1941. Using 1939 as the base year with an index of 100, the cost of wage labor moved to 106.7 in 1941, 118.4 in 1942, 140.4 in 1943, 156.1 in 1944, and 159.1 in 1945.

Average weekly hours worked increased 18 percent over 1939. Furthermore, because of manpower withdrawals for military service and for higher-paying jobs in the war industries, labor efficiency declined steadily, adding directly and indictly to labor costs. Replacement of labor was difficult. Belatedly, it was discovered that unskilled and semi-skilled workers within the industry developed certain skills and techniques which could not easily be acquired by newcomers.

Estimates place the decline of labor efficiency between 1939 and 1945 at 30 to 50 percent. However, in an unstandardized industry which does not use a belt or piecework system, precise measurement of labor efficiency is not possible. There are no indexes indicating the increased cost of salaried employes but judging from other industries it would be safe to assume that they did increase though at a slower rate than wage labor.



Increase in cost of wage labor in U. S. oil well drilling (1939 equals 100 percent).

Equipment Cost Increase

Equipment costs increased during this period but OPA price control was effective in curtailing the rise. From 1939 until the institution of price control in the early spring of 1941, the prices of pumping and flowing equipment were estimated to have risen 8 to 10 percent without a corresponding increase in efficiency. Under price control, increases were granted to various manufacturers but the total only averaged approximately 2 percent per year. Between 1939 and 1945, costs for this type of equipment increased roughly 20 percent.

Casing costs presented a special problem. The price of tubular steel products was rigidly held throughout the war period up until the general price increase early this year. However, because of the general shortage of steel, price advantages resulting from purchases of specified lots were frequently lost. Drilling activities were often interrupted for days because of casing shortages and, though work was almost at a standstill, expenses continued to mount. Thus, despite the rigidity of the market price of casing, other factors intervened which for practical purposes considerably increased its final installation cost.

Factors Influencing Cost

A variable factor affecting costs is that of depth. Costs vary directly with depth though not in proportion—at a depth of 3000 feet an average of almost one man-hour of labor per foot had been required. A five-fold increase in depth may quite easily result in a ten-fold increase in cost. Average depth per well though varying from area to area registered an increase of over 500 feet between 1939 and 1945. Though equipment costs remain constant, other

expenditures—especially for labor and energy—increase at a cumulative rate with greater depth.

Variation in labor and equipment costs owing to depth changes was accounted for by a "depth" factor. This was computed for each state as follows: 1939 casing and labor costs per well were multiplied respectively by the number of wells drilled in 194X—the resulting figures indicated the cost of labor and casing at 1939 prices and depths. By multiplying the labor-cost figure thus obtained first by the percent increase in depth and then by the labor-cost index for 194X, the change in cost for labor owing to depth change was obtained. The change in cost for casing was determined in a similar fashion. The sum of both was added to (or subtracted from) the base figure.

The final major factor determining the average cost of wells is the percentage of productive and unproductive wildcats drilled during any year. Costs for this type of well are substantially higher than costs for other wells and any unusual increase in the number drilled will raise the average costs rather decidedly.

Estimated Capital Expenditure in the Crude Petroleum and Natural-Gas Drilling Industry, by State, 1939-1945[1]

(Thousands of dollars)

STATE	1939	1940	1941	1942	1943	1944	1945
U. S. Total	455,386	529,249	547,604	377,582	435,568	642,239	741,071
Arkansas	10,428	7,207	6,661	10,857	13,157	13,616	10,129
California	67,763	71,995	80,049	53,464	100,848	157,143	177,508
Illinois	41,046	51,000	49,254	29,867	30,059	36,305	30,937
Indiana	2,376	5,971	4,984	3,255	3,311	4,139	3,792
Kansas	20,759	31,142	32,362	25,097	33,158	34,547	34,347
Kentucky	3,743	1,750	1,660	1,166	3,945	8,033	6,391
Louisiana	54,285	76,755	75,907	52,240	47,007	61,129	85,378
Michigan	9,620	7,618	6,713	5,746	6,110	7,224	8,466
Mississippi	937	11,278	9,797	5,848	6,066	16,136	30,729
Montana	1,569	2,049	2,617	2,383	3,403	5,476	3,841
New Mexico	15,903	14,654	8,936	9,502	8,024	13,621	15,408
New York	1,531	1,657	1,987	2,490	3,195	3,327	3,098
Ohio	4,866	5,168	8,895	7,300	5,805	8,722	8,640
Oklahoma	26,022	27,800	26,689	21,330	25,852	41,876	54,302
Pennsylvania	7,031	10,621	12,059	12,365	9,987	13,264	12,582
Texas	174,226	188,387	203,545	118,399	113,694	183,998	221,497
West Virginia	5,960	6,250	7,988	9,344	10,090	15,088	12,448
Wyoming	5,906	6,842	5,901	5,664	9,380	15,170	16,044
All Others[2]	1,415	1,105	1,600	1,265	2,477	3,425	5,534
Average cost per well (dollars)	$16,529	$17,264	$17,420	$18,121	$23,241	$26,662	$29,217
Percent increase over 1939	.....	4.45	5.39	9.63	40.61	61.30	76.76

[1] For construction expenditures in this industry see Department of Commerce Industry Report "Construction and Construction Materials," May, 1946, page 18.

[2] This category includes Alabama, Arizona, Colorado, Florida, Georgia, Iowa, Missouri, Nebraska, North Carolina, South Dakota, Tennessee, Utah, and Washington.

Increase in Wildcats

A pronounced increase in the number of wildcats drilled did occur in 1943 following an appeal by the Petroleum Administration for War for greater production. In 1939, the 2961 wildcats accounted for approximately 10.7 percent of the total number of wells drilled; in 1940, 3164 for 10.3 percent; in 1941, 3697 for 11.8 percent; and in 1942, 3166 for 15.2 percent. In 1943, the largest percentage of wildcats ever drilled was recorded—3612 or 19.3 percent of total wells drilled. This factor, coupled with the 22-percent increase in average cost over the previous year, resulted in an unusually sharp increase in average cost over the previous year.

In 1944, 4324 wildcats represented 18.0 percent of the total and 4337 in 1945, 17.1 percent. In addition, average depth—particularly of the productive wildcat wells—increased more rapidly than the drillings in established fields. The increase in the number of wildcats in conjunction with the rising cost of labor, played a major role in increasing the average costs per well.

Computation of Expenditures

As stated previously, the 1939 expenditures were arrived at by multiplying the number of the various types of wells by actual Census costs and making an almost negligible addition to cover added costs for the deepening of existing wells. Except for slight upward adjustments to cover the increase in the cost of pumping and flowing equipment and the changing depths of wells, the 1940 expenditure was determined in similar fashion. The labor cost, which diminished a fraction of 1 percent in 1940, could be safely ignored.

After 1940, computation became more complicated as other factors entered the scene. The estimates from 1941 through 1945 were kept on the conservative side primarily because of the lack of sufficient data to warrant higher estimates.

Costs in 1941 increased slightly over those of the previous year. Labor costs rose about 6.7 percent over 1939 and equipment costs were up approximately 10 percent. In 1942, the upward trend was clearly discernible. Efficiency began to decline, labor costs jumped 12 percent over the previous year, the percentage of wildcats drilled increased appreciably, and material shortages began to be felt.

To compensate for these rising costs, the 1939 base figure was inflated by the increase in the cost of labor—18.4 percent. It was estimated that this figure would account for the rising costs of drilling.

Total Expenditure

Total expenditure was arrived at by adding to this figure expenditures for the deepening of existing wells and the adjustments caused by depth changes. This procedure was used to estimate the 1943 expenditure—the 40.4 percent increase arrived at certainly compensated for the large percentage of wildcats drilled.

A different technique was adopted for 1944 and 1945. The labor-cost index for each of these years was applied to only 50 percent of the base and the remaining 50 percent for each year was increased by 40.4 percent (the 1943 inflation factor). Labor costs were increasing more rapidly than the other costs and application of the labor index to the base figure would have resulted in too high a total expenditure. For each of these years total expenditure was the adjusted base plus the increased costs owing to greater depth of new wells and the deepening of existing wells.

Expenditures and Outlook

During this seven-year period, the estimated average cost per well drilled rose from $16,529 in 1939 to $29,217 in 1945, an increase of over 75 percent. The major increase occurred in 1943 when, for the reasons mentioned earlier, costs increased 31 percent over the previous year. Substantial increases were registered in the 2 succeeding years—21 percent in 1944 and 15 percent in 1945.

Under present unsettled conditions it is difficult to forecast the trend of future costs in the industry. It is doubtful, however, whether costs will continue the rapid upward trend of the 1943-45 period. Costs of steel casing and equipment have increased but shortages have been materially reduced and the increased costs resulting from shortages have been eliminated. Labor efficiency has improved and the labor situation in general has eased considerably. Reduction in average cost per well is not likely in the immediate future, but that possibility does exist if productive efficiency of labor and equipment increases.

It is estimated that a total of $3.7 billions in new capital was expended by the industry in the seven-year period and that, if exploratory costs are included, the figure would probably be close to $5 billion. The 133,000 producing wells drilled during the period are approximately 30 percent of those operating at the end of 1945. However, because of the inflated costs, they account for slightly more than that proportion of total capital investment in the industry.

Higher Costs Likely

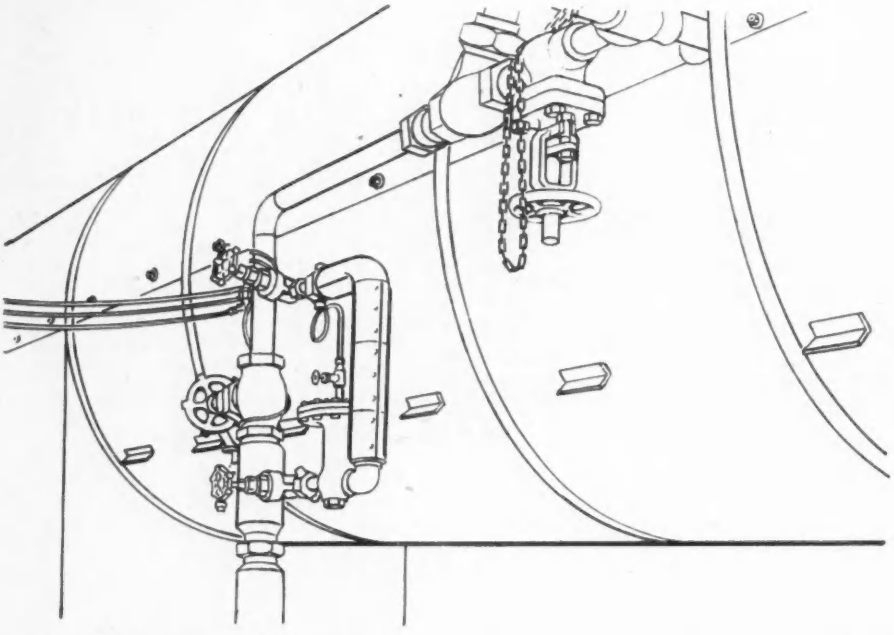
Despite this large investment, proved reserves have declined about 10 percent and the ratio of reserves to production about 30 percent. This is primarily because of the reduction in the number of known undeveloped oil-bearing areas.

The ratio of dry holes to the total number drilled is increasing. Dry holes, amounted to 23 percent of the total in 1939, reached a new high of 32 percent in 1943 and declined to 29 percent in 1945—total cost of these dry holes for the seven-year period was over $¾ billion.

There is a definite trend toward drilling deeper, high-cost wells. To keep pace with the growing demand for petroleum and gas and their products, and to compensate for the diminishing return per newly drilled oil well, total expenditures in the industry will probably continue to increase and should approach if not surpass the billion dollar-a-year mark.

An interesting implication of this high level of expenditures is the large potential market for oil-field machinery and equipment as compared with war and prewar years.

Angle Iron Clips Welded To Boiler Sheathing Facilitate Installation



BOILER CARE

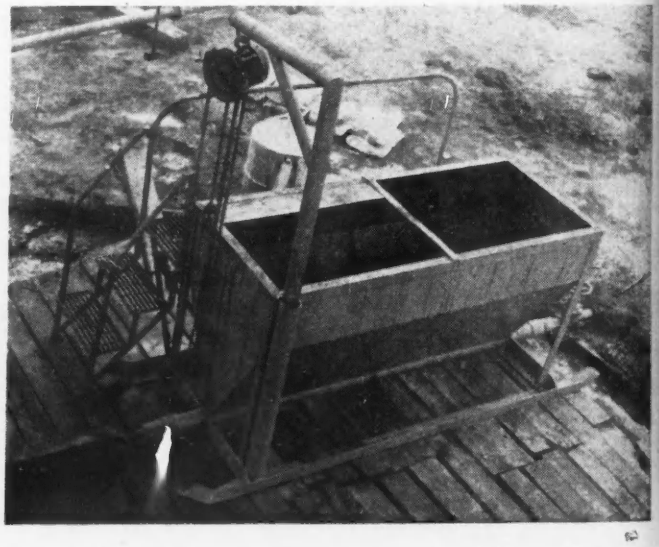
A convenient method of cinching up and bolting together the light sheathing with which high pressure insulated boilers are covered is contained in the system of clips which one operator welds to the under side of the covering. Short lengths of ¾ or one-inch angle iron are welded to the under side of the lower sections as illustrated. When the sheathing is being drawn together for bolting to the upper sections, small hooks or clamps may be hooked under the fixed units, after which light tackle can be attached for drawing them up tightly and the encircling straps then cinched in place. Such clips materially reduce the installation time and eliminate much of the danger of damaging the light sheeting when makeshift tools are used in drawing the material together. Cost of welding these angles to the sheathing is small compared to money saved.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

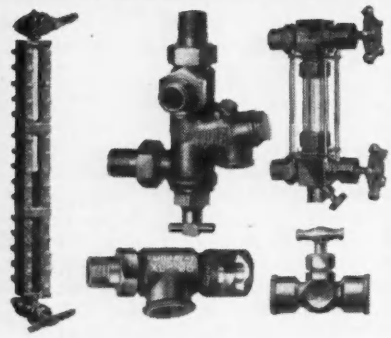
Unitized Vat Holds Large Volume of Mud Chemicals

MUD CONTROL

In drilling wells where the mud treating program has more or less been established and it is known in advance the type of treatment employed, it has been found economical and convenient to build a chemical mixing vat of the type shown. The wedge-shaped steel container will hold sufficient mixed chemical to sustain correct drilling mud characteristics for several days, and thus eliminate the need of mixing chemicals every tour. Constructed of sheet iron, the vat is approximately five feet high, three feet wide and is mounted on angle-iron skids for ease in transporting. The point of the wedge is formed by a three-inch diameter section of pipe connected to the water supply on one end and the dispensing valve on the other. A bracket and chain hoist as illustrated have been provided to lift the cans or drums of chemicals to the vat level. A metal walkway constructed of salvaged pipe forms part of the unit. Handrails at the edge prevent workmen from falling off during night tours, and the platform makes it an easy task of mixing chemicals. Thorough mixing may be accomplished by means of the high-pressure water hose if necessary. In this manner, a complete drum or can of chemicals may be mixed at one time in sufficient quantities to supply chemicals for long periods of time. Any increase or decrease in chemical treatment may be made by adjusting the dispensing valve located over the return mud ditch. The entire unit is located on board platforms to present a neat and efficient arrangement. Many man-hours are saved by large-quantity chemical mixing, and the portability of such a unit makes for a convenient and desirable piece of equipment.



PENBERTHY
QUALITY PRODUCTS



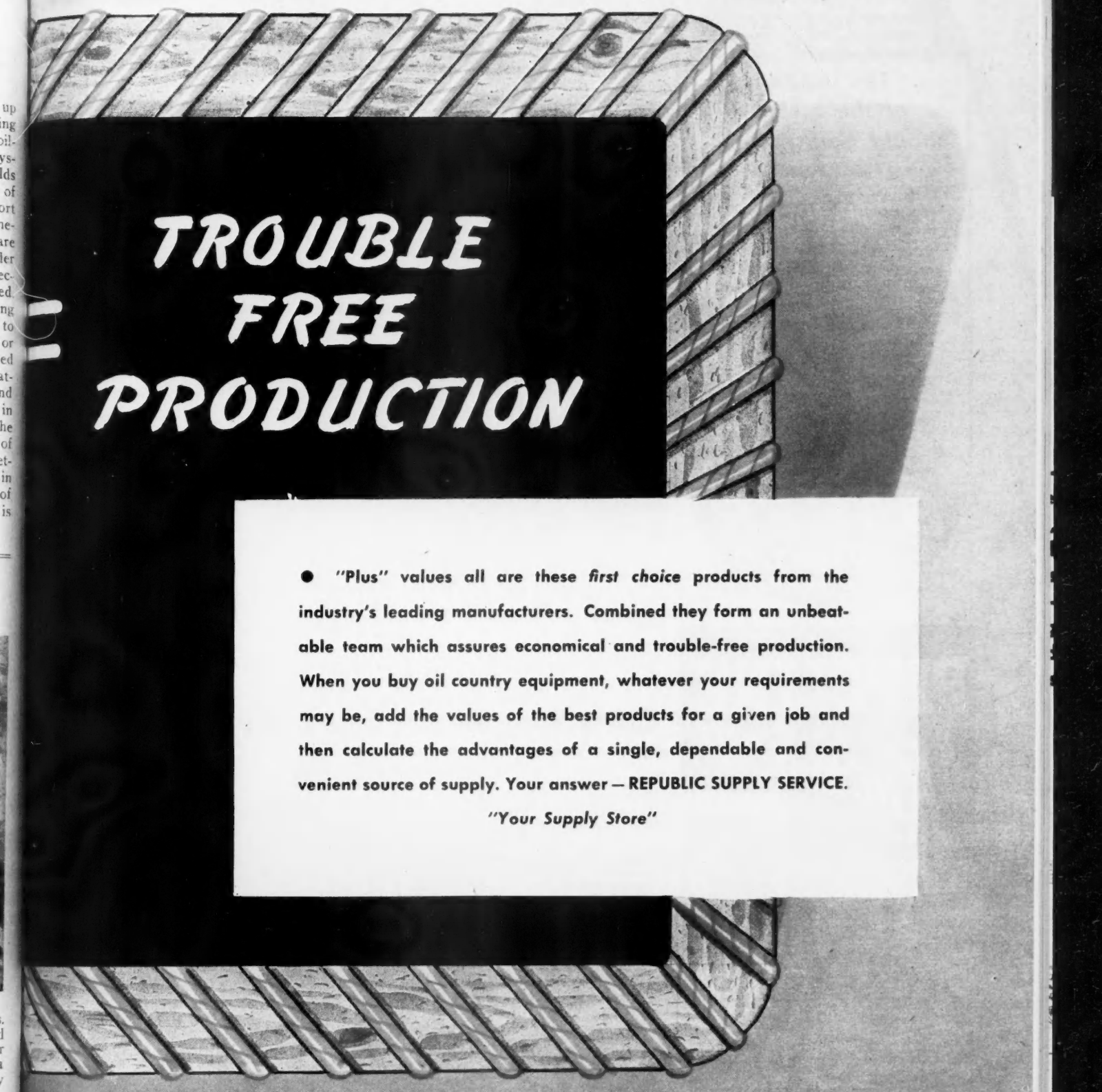
Penberthy liquid level gages of various types—injectors—ejectors—all so widely used throughout the oil industry because they have always been dependable under the most severe service conditions.

All are of rugged construction and made by an organization with 57 years experience in the manufacture of quality products.

See Pages 2450 to 2455, Composite Catalog

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

AS A·B·C·



TROUBLE FREE PRODUCTION

● "Plus" values all are these *first choice* products from the industry's leading manufacturers. Combined they form an unbeatable team which assures economical and trouble-free production. When you buy oil country equipment, whatever your requirements may be, add the values of the best products for a given job and then calculate the advantages of a single, dependable and convenient source of supply. Your answer — **REPUBLIC SUPPLY SERVICE.**

"Your Supply Store"

Republic Supply COMPANY

GENERAL OFFICES · · · HOUSTON 1, TEXAS

REPUBLIC STEEL

Reg. U. S. Pat Off.

FACTS
ABOUT COMPLETING ANY WELL, IF YOU ARE INTERESTED IN ITS FUTURE

The inside of the casing should be scraped!

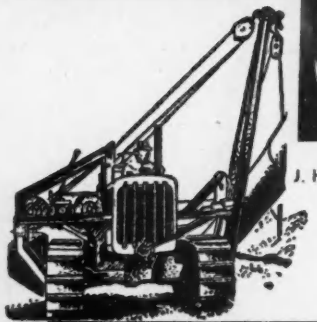
Burrs from gun-shot holes, hardened cement and mud, paraffine and mill or rust scale, all can be removed from the inside of your casing. Think of the saving of time and money when you can run swabs and packers at any future time without tearing up rubbers; think how you can run tools in and out of the hole without hanging up on any obstructions; think how securely you can pack off against clean, smooth casing. Plan ahead to scrape your casing while the rig is up, and

Phone the Baker man in your territory . . .

BAKER
ROTARY
CASING SCRAPER

PIPELINE "Know-how"

J. H. (Herb) Smith
Partner

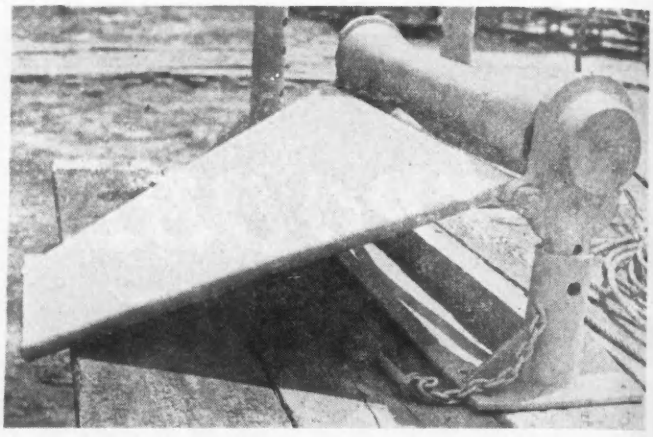


PIPE LINE CONSTRUCTION
COMPRESSORS WELDERS
DITCHERS TRUCKS
DOZERS TRACTORS

SMITH CONTRACTING COMPANY
ODESSA, TEXAS

MAIN BUSINESS OFFICE
FORT WORTH NATIONAL BANK BLDG.
FORT WORTH 2, TEXAS

Improved Pipe Lay-Down Device Shop Made

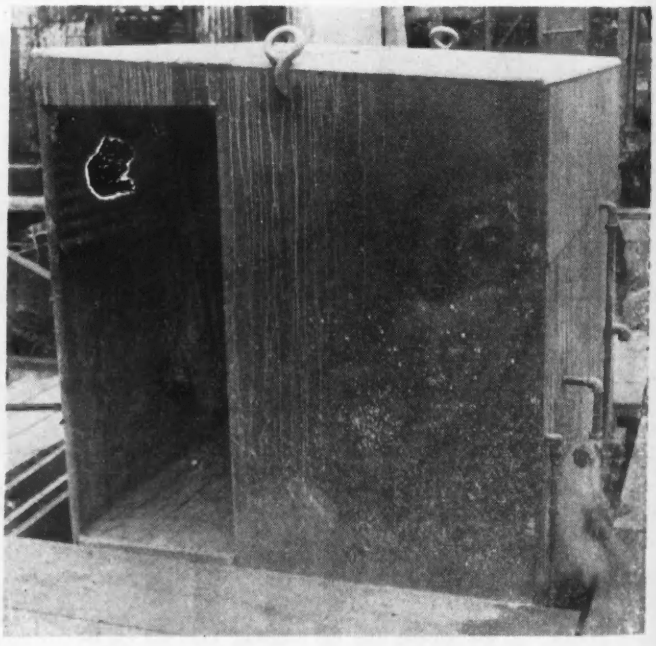


PIPE HANDLING

Laying down drill pipe preparatory to running casing in a well has long been an arduous and time-consuming job, and many operators realizing the cost and effort involved in this operation have undertaken to make the task easier and thus save time and money. A valuable part of one company's laying down equipment is the pipe roller shown. It is more elaborate than those ordinarily found on drilling rigs, but its service and operation make it noteworthy. This convenient pipe roller was fabricated in the shop. It consists primarily of a roller mounted on two adjustable uprights to which has been attached an apron of sheet iron. The base is a flat piece of steel 36 inches long. At both ends have been welded two short sections of three-inch pipe, and the entire base reinforced.

Inside the three-inch pipe is placed a 2½-inch section of pipe which is perforated to form an adjustable leg as illustrated. The roller and roller bearings are specially made. Each end of the hollow roller is cone shaped to prevent pipe from sliding off. The bearing is merely a friction type mounting with sufficient play to assure free movement. The sheet metal apron acts as a protector for the floor and provides a ramp which eases drill pipe off the roller. The device is spiked to the drilling rig floor when in operation, and functions as a part in the laying down equipment which includes a pipe trolley. The adjustable legs and wide roller span have made it a desirable piece of equipment in laying down drill pipe, and it has proven an invaluable safety device.

Change House Mounted Close To Rig Floor



CREW COMFORT

In order to provide more room on the derrick floor for auxiliary equipment, one company has adopted the practice of setting up at each location a small steel change and rest house. Generally located a few feet from the rig floor where men can be easily reached if needed quickly, the small house is equipped with a steam heater, lights and benches. Steam lines and conduiting connections are brought up to the outside rear of the building, making the task of connecting up much simpler than that of rigging up similar installations when they were spread over considerable area on the rig floor back of the drawworks. A pair of heavy steel lifting eyes welded to the top of the structure make short work of lifting and spotting the unit with the aid of a boom-equipped truck.

Among Oil Men in Europe

By DR. J. BRIAN EBY

Members of the Quadrapartite Oil Committee, convening in Berlin at present, include R. G. Phelps, United States; Col. L. R. Hulls, M.C., Great Britain; A. K. Simakoff, Russia, and Jacques Duret, France.

The British member, Colonel Hulls, now retired to civilian life, was associated with Shell in Venezuela in about 1930 and has also spent more than 10 years in Russia. He speaks the latter language fluently. Colonel Hulls left the Shell group prior to entering the war. He now is the director of the oil branch of the British zone in Germany with offices in the North German Oil Control at Hamburg.

The Russian delegate, Simakoff and his assistant Major Gregoriev are both the senior members of the committee, serving in this capacity for more than a year.

* * *

Arthur E. Dunning, executive secretary to the American Chamber of Commerce in Germany for the 12 years preceding the war, and his wife survived 456 air bombardments of Berlin and the taking of the city by the Russians. Dunning was most explicit in pointing out that he and his wife received better treatment from the incoming Russians than the outgoing Nazis. He likewise confirmed with emphasis that the occupying Russians of Germany, Berlin included, treated the property and peoples of Germany with far greater regard than they (the Russians) received from the Germans in earlier days.

Dunning now is working for the Financial Division of OMGUS (Office of Military Government, United States) and resides at 9-13 Griegstrasse, Grunewald, Berlin.

* * *

Major F. Eyolf Bronner, geologist with degrees from New York University and Columbia, is chief of Defenses and Terrain Section of G-2 (Intelligence) Division of USFET at Frankfurt. Major Bronner hopes to return soon to civilian life in Los Angeles.

"Ike" Doughten, former petroleum attache at Paris during the war, is now with Standard Oil Company (New Jersey) and assisting William Crampton in representing American oil interests of the Standard Francaise des Petroles. These American interests are Standard Oil Company (New Jersey), The Atlantic Refining Company, and Gulf Oil Corporation. The phases of the oil business covered includes marketing, refining, distribution and transportation, but does not include exploration. All oil operations in France are pooled at the present time under the jurisdiction of the French government, but steps are being taken to get them back into normal competitive channels. Standard Francaise maintain offices at No. 82 Ave. des Champs Elysees, in Paris.

* * *

William Brewster represents The Texas Company at No. 7 Place Vendome, Paris. This company's refinery at Bec d'Ambes, on the Gironde River, near Bordeaux, was badly smashed during the war and has not yet been returned to operation. The company is actively engaged in distribution at the moment.

* * *

Arthur Reed heads Socony Vacuum Oil Company in Paris, with offices at No. 46 Rue de Courcelles. Reed was U. S. Army oil advisor in French North Africa during the war. At present Socony-Vacuum are operating in marketing, refining and distribution. They have two refineries working, the one at Notre Dame de Gravenchon and the other at Sete, both in southern France.

* * *

Stacey Adams is representing Sinclair interests in Paris from his suite at the George V Hotel. Sinclair sold most of their operations just before the war and at present are primarily interested in bulk cargo requirements.

Arabian-American Company (Standard of California and The Texas Company) interests are handled by a Mr. Barthelmess, from the Hotel Ritz. Their immediate concern in France is the sale of Arabian crude.

* * *

R. G. Phelps, chief of the oil section, Economics Division, OMGUS, in Berlin, was formerly general manager of the Colonial Beacon Oil Company and later an independent oil man in New York. James A. Fawcett deputy chief of the section, and Joe W. Perry is U. S. liaison officer for the section in Hamburg. Miss Juanita L. Buchanan, of St. Louis, Mo., is administrative assistant.

* * *

Philip Clover, former chief of the oil section, is now advisor to the North German Oil Control, C.C.G. British Element, and advisor to property control on the interests of Socony-Vacuum Oil Company. W. Greeven, also formerly with the oil section, holds the identical status in Hamburg on the interests of the Standard Oil Company (New Jersey).

* * *

Tidewater and Atlantic have representatives in Hamburg and The Texas Company and Gulf are also watching the oil developments in this area.

Petroleum Attache

Richard Funkhouser, formerly a geologist in the United States for Shell Oil Company and later with Standard Oil Company of Venezuela, is the acting petroleum attache to the United Statts Embassy in Paris, France.

Richard Funkhouser

Funkhouser received an A.B. degree in geology from Princeton University in 1936. During 1943-45 he served as a pilot in the U. S. Air Corps.

Pipe Lines Relieve Rails In Zistersdorf Oil Field

The rail congestion in Austria caused by the transportation of Zistersdorf crude and products from the pipe line terminus north of the Danube to the refineries south of the river has been relieved by the laying of two pipe lines under the river.

One line carries crude to the "Nova" refinery at Schwechat and the other line transports refined products from Schwechat to Lobau. Construction was started in April and the lines are reported by the **Oesterreichische Zeitung,** Austrian newspaper, to be in full operation. The river crossing sections are 1480 feet in length and are of welded construction, reinforced by special welded couplings. The land line extensions connecting them to the previous terminal are two miles in length but it is reported that existing pumping facilities are adequate for the operation of the whole system.

Because of economies thus effected, other rail extensions are contemplated.

Shell Keeping Two Diesel Rigs Busy On Its Block Southeast of Maracaibo

Socony Vacuum Oil Company's principal wildcatting venture in Venezuela still is centered on a solid block of more than 3,350,000 acres in the state of Barinas in the region southeast of Lake Maracaibo. The company has been working in this area for several years.

The main base camp at Barinas has been enlarged during the past year to take care of an expanded staff, and a new hospital was recently completed. Thus far the area is still supplied by the tortuous water route up the Orinoco River and its tributaries as far as heavy equipment is concerned. However, it is hoped that enough dry weather will enable the completion of some kind of overland route.

Plane Moves Supplies

Two medium heavy diesel rigs are kept running at various points in the block, and at present are operating under difficulties. Recently the company obtained a transport plane of the type known in the Air Force during the war as a C-47, and is keeping both rigs supplied. One of the tests in particular, the Calzada 1, in the center portion of the block, has been completely isolated since the start of the rainy season and is entirely dependent upon the plane for all transport of supply and personnel. The Calzada 1 is fishing for stuck drill stem ing oil or gas showings have been reported. The rig was moved to this location, about 30 miles southwest from the company's Sylvestre 1, abandoned early this year at 10,100 feet.

Busy with Second Test

In the extreme western part of the state, Socony-Vacuum completed its Yaurie 1 as a dry hole at 9000 feet, and has spudded its Yaurie 2, located a few miles north from the first test. The second test now is drilling below 5000 feet.

Normally five geophysical crews have been maintained on the block, all seismograph, but the rainy season has curtailed this work materially. At this time only three crews remain at work while the other two have been moved to other parts of the country until the next dry season which should start in the middle of the Fall. One of the latter crews is working in eastern Venezuela while the other is busy on general reconnaisance work.

The company also is doing some exploratory work in the state of Monagas, although no drilling with heavy rigs has been started. Two portable structure-drill units are busy drilling core holes, and two additional mechanical rigs have been ordered for the same purpose. The core holes are drilled to about 4000 feet.

Russia Has Big Plans for Her Deposits of Oil and Gas Shales

An important feature of Russia's plan to develop her fuel resources is current work to expand the production of oil and gas from shale deposits in Estonia and the nearby regions of the Leningrad Province. The total extent of Russia's shale deposits is not yet known but the Estonian fields are estimated to have five or six billion tons of shale capable of yielding a billion tons of oil or billions of cubic feet of gas.

By 1950 the Russians plan to rebuild Estonian and Leningrad Province shale mines with a capacity of 9,400,000 tons annually and 3,000,000 tons annually, respectively. By 1950 the output of gas from shale and coal is expected to jump to more than 18 trillian cubic feet, of which shale alone will account for an important proportion. To accomplish this the Russians are building shale gas and shale processing plants in a number of districts, particularly Kokhtla-Yarve, Akhtme and Kivyilli in Estonia. Work has already begun. By comparison with 1945, output is scheduled to increase ten-fold by 1950. Estonian shale gas will be piped to the factories and residences of Leningrad, giving that city for the first time a cheap and steady source of fuel which will not encumber the overloaded railways.

At Akhtme a tall building rises above the countryside. This is shale mine No. 10 which is about to begin work. Next to the mine buildings are the structures being erected for the shale oil refinery and power station, also operating on shale.

At Kokhtla-Yarve the Russians are building a huge experimental "battery" consisting of nine ovens which will produce shale gas. The battery is mainly designed to train experienced workers for the shale fields and refineries and gas works. The battery will be watched to determine the exact "regime" to be adopted in developing the industry nearby and elsewhere.

Similar batteries are to be erected at Kokhtla-Yarve's other plants, at Akhtme and in the city of Shale, Leningrad, Province. Each of these plants will have 276 gas ovens.

Shale Works Progress

The construction of the shale works at Kokhtla-Yarve began in June. By August the work on that shale oil refinery was 60 percent complete and about a third of the necessary machinery has been installed. Nearby a city for 20,000 residents is being rushed to completion.

Russia's shale construction projects lack foremen, accountants, paymasters, and other more skilled workers. In addition, the Leningrad Gas Machinery Works is not capable of coping with the demands for machines and even plans. These were held up for months this summer.

Much of the development is slowed also by the slow process of construction of the Akhtme power plant which is about two-thirds finished, but although the boilers are arriving, there is a severe lack of cement, bricks and metal.

Change Since War

Before the war Estonia had made a good start on her shale industry. The work was handicapped, however, by lack of an immediate market. The Germans planned to use the deposits for oil but did not have time to carry out their plans. Today, with Leningrad nearby, and Estonia as a whole undergoing rapid industrial expansion, the country's shale has an important role to play.

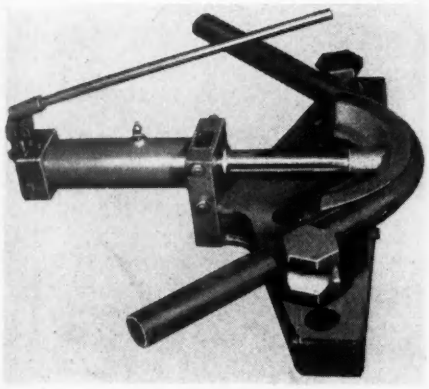
In the Urals and the Komi Republic vastnesses, too, shale deposits have been found and are being rendered useful. Figures are lacking here also, but the Russians claim that the Pechora basin and nearby regions such as Ukhta have more shale than the rest of Europe and perhaps as much as most of the rest of the world. Development of these resources is hindered by lack of nearby markets, transportation and skilled labor.

NEW EQUIPMENT LITERATURE

For additional information, use mailing card inserted opposite this page

1—Pipe Bender

An open-jaw, portable hydraulic pipe bender developed to simplify pipe bending problems has been introduced by The Watson-Stillman Company. Easy to operate, the pipe bender consists of a



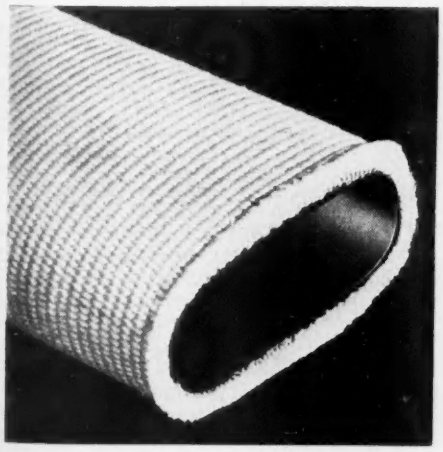
small hydraulic hand pump and hydraulic cylinder. Interchangeable bending dies fit on the operating end of the ram to make bends on any size pipe up to three inches in diameter, or mild steel bars up to two inches in diameter. The minimum bending radius is approximatel four times the nominal diameter of the pipe, and approximately 90 to 180 degrees angle of bend, depending on the size of pipe.

Prime feature of this bender is the open jaw which permits the pipe to be readily placed into and removed from the bender without having to remove any of the bending dies or formers. A gauge can be furnished where a number of bends of the same angle is to be made.

(Check item 1 on postcard for more information.)

2—Fire Hose

American-LaFrance-Foamite Corporation announces an "All-Weather" line of water-repellent, mildew-resistant fire hose. Made exclusively for American-

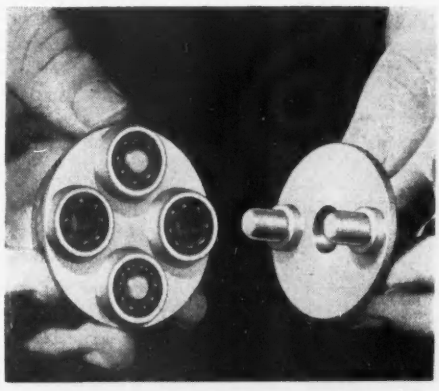


LaFrance by Goodyear Tire and Rubber Company, the fire hose is double-jacket tailored, and built to withstand the abrasive action of gravel, cinders or rough surfaces over which it may be dragged. It is said to withstand extreme temperatures, from freezing cold to blistering heat. Being flat cured, the hose is flexible for easy handling during emergencies and for racking snugly and completely into a hose body before and after service. The Alaseptic treatment (mildew inhibiting) is applied at the same time the new hose receives the double water-repellent treatment. The all-weather, water-repellent fire hose is available in five different brands, each brand having special characteristics of essential importance. Specifically, the brands are known as (1) Cabledge, (2) Fendwell, (3) Alflex, (4) Ranger, and (5) Beacon.

(Check item 2 on postcard for more information.)

3—Couplings

Smaller Morflex couplings, designed for the low power-takeoff of fractional-horsepower drives, are recent additions to the line of power transmission equipment manufactured by Morse Chain Company, Detroit.



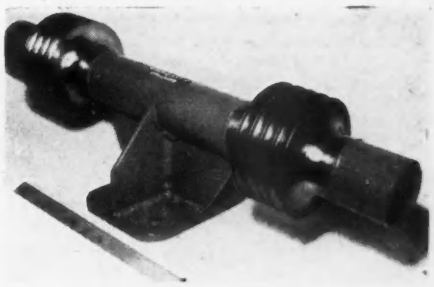
Available in two new sizes, handling three and nine foot-pounds torque, the couplings weigh approximately ½ pound and 1¼ pounds, respectively. Maximum revolutions per minute is 3600 for both sizes. The choice of stock bores ranges from ¼-inch on the smaller to 1-inch on the larger. As in its larger couplings, Morse uses the flexible Neoprene biscuit assembly, which shields machine installations from shock and permits slight angular misalignment of shafts while transferring maximum power. The Morflex coupling is unaffected by oil, dirt or weather, and requires no lubrication.

(Check item 3 on postcard for more information.)

4—Anchor Joint

A new anchor joint, the latest in its line of packless expansion joints, has been announced by the MagniLastic Division of Cook Electric Company. The anchor joint is designed to compensate for unequal thermal expansion and contraction on either side of the anchoring point due to differences in pipe length and temperatures. This allowance is accomplished by varying the number of flexible bellow flanges on either side of the joint base to accommodate installation conditions.

MagniLastic anchor joints are made for standard pipe sizes from ½ to 24



inches, and for pressures varying from a vacuum to 1000 pounds per square inch. Joints are made of stainless steel, Monel, Inconel and copper to combat most corrosive conditions. The operating temperature range is from minus 300° to plus 1600° F. A variety of fittings such as ells, elbows, tees, Y's, etc., can be incorporated into anchor joints. Welded ends can be supplied, with pipe flanges and inner linings optional. Applicable to all forms of indoor and outdoor piping systems, the line of packless expansion joints is said to minimize the transmission of hydraulic surges and shocks to connected valves and fittings. Standard anchor base dimensions for all pipe sizes, and quotations for specific requirements may be obtained.

(Check item 4 on postcard for more information.)

5—Oil Seal Packing

A new type of oil seal packing has been developed by Johns-Manville Corporation for the protection of bearings. Using no metal, the new oil seal is said to have a high factor of heel rigidity and

a soft flexibility. The product, known as the Clipper Seal, is made with a heel of resin-bonded fabric, giving it the rigidity essential for a press fit in the cavity and with a lip of tough but flexible compound.

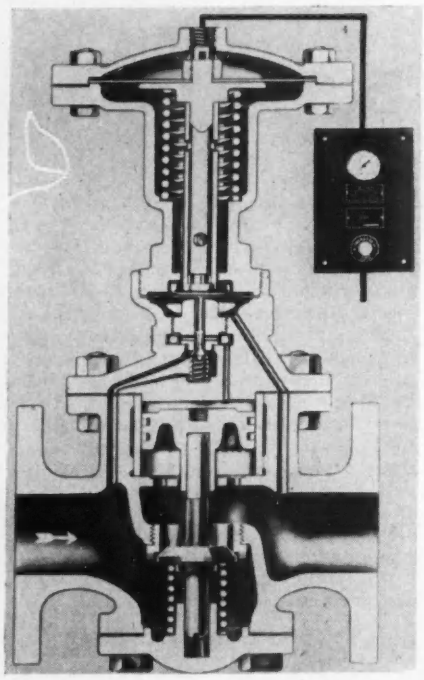
The special lip design makes it possible to vary the bearing area and control the pressure of the lip against the shaft by means of a garter spring, thereby reducing shaft wear to a minimum. Its one-piece precision-made body, concentrically molded and non-metal construction, is said to permit liberal machining tolerances. These oil seals are made in sizes for shafts from 1-5/16-

inch to 37 inches diameter, in both endless and split types. Special designs are available where unusual temperature, pressure or chemical conditions require.

(Check item 5 on postcard for more information.)

6—Reducing Valve

A single-seated, internal pilot, piston-operated reducing valve designed to be remotely adjusted from a conveniently located air loading panel, has been announced by Leslie Company. Known as Class LT-3, this reducing valve with the Type ARP air loading panel is especially adaptable to process piping arrangements. The air loading panel includes a ⅛-inch combination pressure reducing and relief valve (no continuous leakoff) mounted on a panel containing an adjusting knob and a large, easily read air pressure gauge.



In operation, the reducing valve is adjusted to the desired pressure setting by air presure supplied by the air loading panel. The constant loading force on the upper diaphragm of the reducing valve opens the controlling valve and is balanced by a constant reduced pressure proportional to the loading force, thereby maintaining a constant reduced pressure.

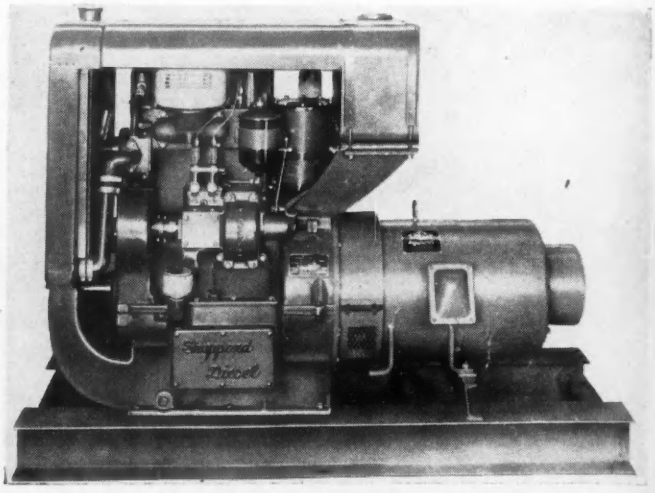
Turning the adjusting knob on the air loading panel clockwise increases loading pressure and reduced steam pressure, while counter-clockwise turning decreases loading pressure and reduced steam pressure.

Furnished in high pressure bronze or cast steel body with flanged or screwed ends, these valves have completely interchangeable replacement parts, stellited seat rings, and hardened stainless steel 800 Brinell main valves as standard equipment.

(Check item 6 on postcard for more information.)

7—Generator

The R. H. Sheppard Company, Hanover, Pennsylvania, has adopted the "Regulectric" A.C. generator as standard equipment on its diesel-driven units of five to 15-kilowatt capacity. The recently developed regulectric system utilizes a novel builtin circuit which provides constant, steady, power-line quality voltage without the use of accessory regulating equipment. It is said to be simple, compact, fool-proof, and without moving parts. Once factory set, it requires no attention while in operation and will maintain normal variation of plus or minus 2 percent from no load to full load, according to the manufacturer. Using the same principle that simplified sharp radio tuning, the "Regulectric" A.C. generator provides the answer to the old problem of droopy voltage in small generator installations. The makers assert that lights stay bright and motors remain peppy even though the power load varies to a great degree, because action is instantaneous in restoring voltage on sudden load changes.



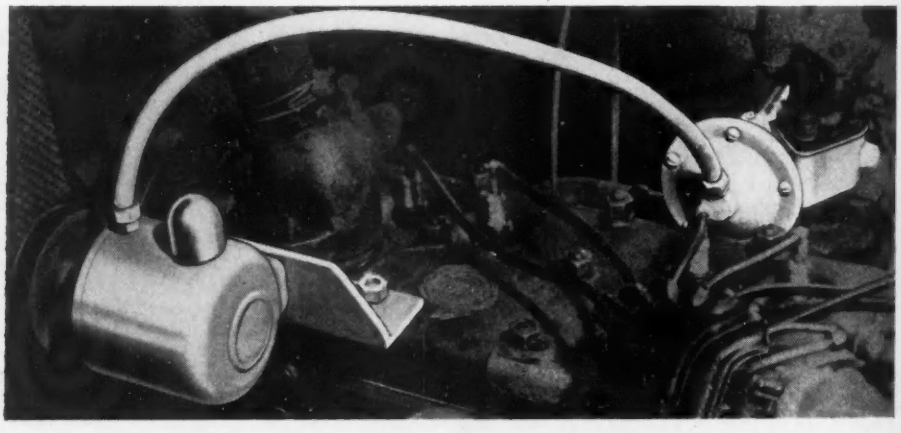
(Check item 7 on postcard for more information.)

8—Hydraulic Governor

A new principle of governing, made possible by combining the principles of hydraulics and centrifugal force, has been announced by the Milwaukee Lock & Manufacturing Company. Four standard types are now in production: (1) automotive, (2) constant speed, (3) over-speed shutoff and (4) universal.

Illustrated is the Milwaukee automotive type hydraulic governor which produces effective engine control, maximum sensitivity, and efficiency without loss of power.

These hydraulic governors are said to be adaptable to any gasoline or diesel engine. They are available in all standard sizes. Outstanding feature of these governors is their flexibility of power takeoff in relation to governor control. This flexibility permits the power source for driving the pressure generator to be located as far as 30 feet from the governor control without loss of operating efficiency. Other features are tamper-proof design, interchangeability between different throttle body sizes using the same pressure generator, ease of installation, and economy.



(Check item 8 on postcard for more information.)

9—Power Rig

Oil Well Supply Company, after five years of experimental work, has developed a power rig which is said to be capable of drilling to 16,000 feet with 3½-inch drill pipe or 12,000 feet with 4½-inch drill pipe. All controls are conveniently located at the driller's position and are said to be responsive to fingertip control.

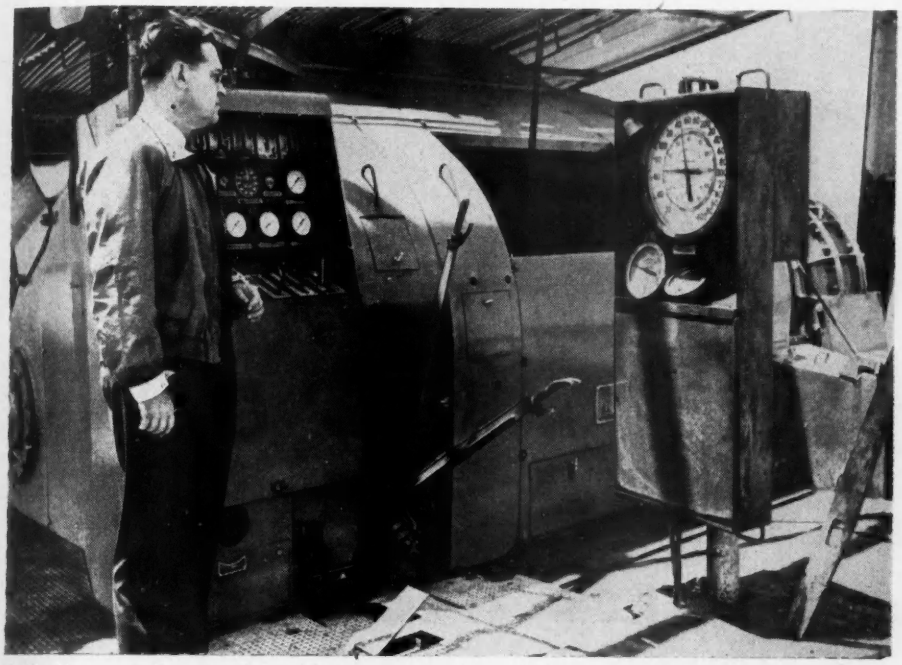
Major units included in this complete rig are a No. 96 draw works unit, five-rotary table, 400-ton swivel, six-sheave 350-ton crown block with companion five-sheave traveling block, a 7¾ x 20-inch main and a 7¼ x 18-inch auxiliary slush pump, and three interial combus-

tion engines capable of delivering 1000 horsepower, plus the necessary transmission equipment and accessories. All control levers and instruments are mounted on a central panel.

Small hand levers actuate air valves which control operations of the draw works, drive, rotary pumps, and sand reel. The three engines are similarly controlled by hand throttles in the panel and can be operated either singly or in compound. For hoisting, control may be shifted to a foot pedal. Air-operated friction clutches to the rotary and automatic cathead on the rotary side are controlled by foot pedals at the base of the central control panel. On the main control panel are mounted instruments to show air pressures, engine vacuums, transmission shaft speeds and oil pressures.

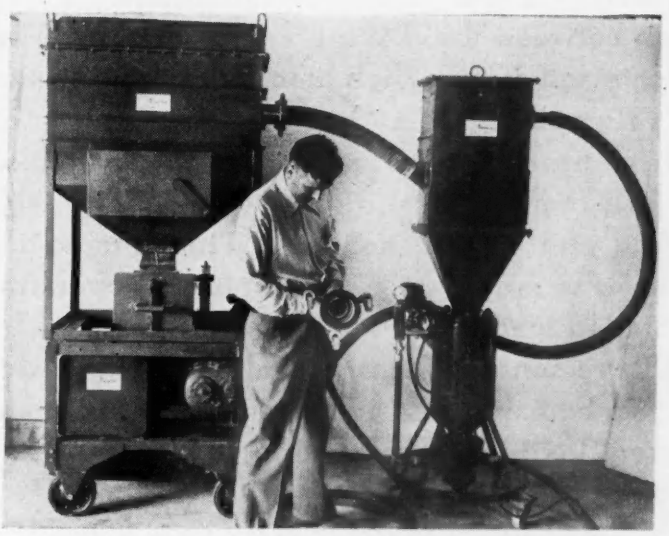
Designing the draw works and transmission as a single unit assures good alignment at all times. This unit can be moved as one load 21½ feet long, 9½ feet wide and 8⅓ feet high by disconnecting merely the air controls and drive chains to the compound and rotary. By unbolting the transmission from the draw works and disconnecting the flexible couplings to the high and low speed jack shafts, transmission can be removed as a unit and an 8-foot road clearance can be secured. Thoroughout moving operations, all openings are enclosed by suitable covers which protect internal parts from dust and weather.

(Check item 9 on postcard for more information.)



10—Blast Cleaner

The Vacu-Blaster, an entirely new blast-cleaning device designed to clean or refinish metal, concrete, or other hard surfaces, is in production by the Vacu-Blast Company. Unique feature of the new machine is its vacuum return system, which is said to prevent the escape of abrasive or other particles. The complete unit consists of the blasting gun, abrasive reclaimer, dust collector, abrasive storage tank and vacuum pump. The cleaning tool is a combination blast nozzle and vacuum cleaner head. While the surface to be cleaned is blasted by steel grit from the nozzle, the resultant refuse and spent grit are picked up simultaneously by the vacuum system and returned to the abrasive reclaimer for separation.



The entire cycle is controlled by push buttons. The cleaning equipment is powered by 220/440-volt, three-phase, 7½-horsepower electric motor. The vacuum pump handles 325 cubic feet of air per minute, and the reclaimer and storage tank has a 250-pound storage capacity. Hoses are made in 25-foot sections and are equipped with built-in electrical control conductors.

(Check item 10 on postcard for more information.)

Literature

11—Portable Masts

EMSCO Derrick & Equipment Company has published Bulletin 201-A, a fully illustrated, 24-page, four-color description of the company's bulge-type portable masts. Complete information on Types 12P and 17P is offered. Features of this type drilling mast are fully discussed and illustrated by field photographs. Construction and safety features are described in detail. Methods of erection are presented.

Type "M" and "C" sub-structures, designed especially for these portable masts, are shown in detailed drawings which include dimensions. Photographs show both in use. Field breakdown for transporting the mast suggests how the parts may be hauled from job to job to meet highway regulations. Complete specifications covering both types are included.

(Check item 11 on postcard for more information.)

12—Spudders

"High-speed Drilling . . . At Low Cost With IDECO Model 16 Steel Spudders" is the title of bulletin S-16-46, recently published by International Derrick and Equipment Company. Of standard size, the bulletin is printed in two colors and is fully illustrated. Photographs showing the model 16 spudder mounted on both trucks and trailers may be found. A detailed break-down of individual parts is presented, giving a description of the features in each case. Specifications and descriptive material fully covers the spudder, which according to the bulletin is designed to spud oil, gas or water wells down to 1000 feet. Recommendations are listed for equipment to be used with this spudder.

(Check item 12 on postcard for more information.)

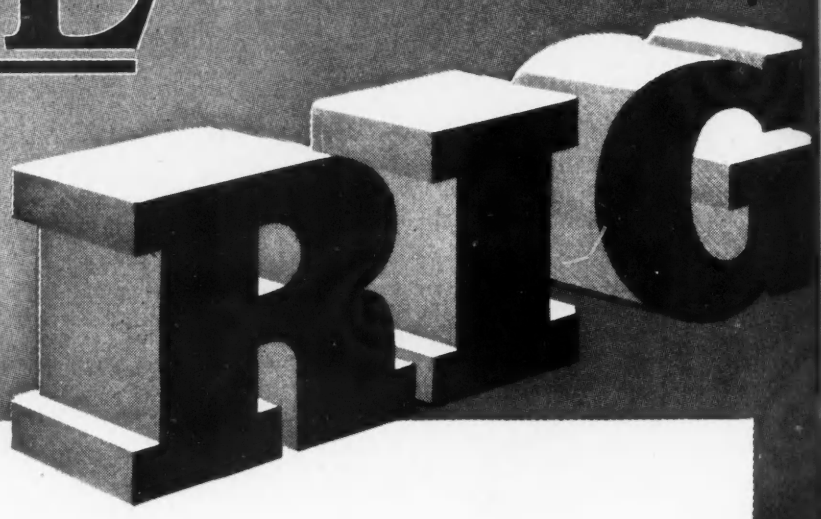
13—Lighting Plants

Stewart & Stevenson Services has issued a four-page folder describing the firm's line of drilling rig lighting plants. Inside pages present features of these lighting plants as well as illustrations which show the design and appearance of the fabricated units. The two-color publication gives the important specifications of each of the diesel and gas-gasoline-butane engine driven plants which range in size from 5 to 25 kilowatts.

(Check item 13 on postcard for more information.)

IDEAL

"Reg. U. S. Pat. Off."



The design of Ideal Consolidated Rigs permits the application of various combinations of internal combustion engine power. Owing to the varied requirements of engine power and field preferences, several types and sizes of drive groups have been made available to obtain the desired distribution of power for hoisting, drilling and pump operations. These alternates are as follows:

COMPOUND DRIVE GROUP

TYPE 50 Two-Engine V-Belt (Standard)

TYPE 75 Two-Engine V-Belt (Standard) . . . Two-Engine Chain (Optional) . . . Three-Engine Chain (Optional)

TYPE 100 Two-Engine Chain (Standard) . . . Three-Engine Chain (Optional)

TYPE 125 Three-Engine Chain (Standard) . . . Four-Engine Chain (Optional)

National has pioneered the application of hydraulic couplings to internal combustion engine rig drives and now offers them as optional equipment in many rig and engine combinations.

The fluid connection between the driving and driven members of the coupling provides a soft drive which blocks the transmission of shock loads between rig and engines.

This type of fluid drive has the further properties of transmitting engine torque without loss or multiplication and with a controllable slip between the driving and driven members. This permits fine control of speeds over a wide range, even to the point of operating the engines against a stalled load.

The outstanding achievements in Ideal Consolidated Rig design offers marked advantages, both in reduced maintenance of rig and engines, and in increased flexibility of operation.

Seasonal Trends of Production and Stocks of Products are Extended

The industry's operations in the week ended September 28, were fairly close to those in the previous week, and seasonal trends of production and stocks of products continued to be extended.

U. S. crude production of 4,778,000 barrels daily in the week of September 28, was 3000 a day more than in the previous week, and 421,000 a day or 9.7 percent more than in the comparable week of last year.

Crude runs to stills at U. S. refineries averaged 4,829,000 barrels daily during the week, an increase of 44,000 a day over the previous week. These runs exceeded daily domestic crude production by 51,000 barrels and were 1,068,000 a day or 28.4 percent more than runs of the week ended September 29, last year.

Refinable crude stocks were reported by the Bureau of Mines to be 222,664,000 barrels on September 21, after having been increased 761,000 barrels during the preceding seven days, and were 7,247,000 barrels or 3.4 percent more than stocks of September 22, last year.

Production of gasoline, including natural blends at the refineries, amounted to 14,675,000 barrels in the week of September 28, a decrease of 49,000 barrels from the previous week, but 3,059,000 or 26.3 percent more than the 11,616,000 barrels produced in last year's corresponding week. Stocks of finished and unfinished gasoline stood at 85,324,000 barrels after withdrawals totaling 530,000 barrels were made during the week. These stocks, although at a low level for this year, exceed those on hand a year ago by 9,114,000 or 12 percent.

Distillate fuel output of 5,832,000 barrels during the week ended September 28 was 382,000 barrels above production of the week before and was 1,784,000 barrels or 44.1 percent in excess of output in the comparable week last year, when 4,048,000 barrels were produced. Stocks of this light fuel oil were increased 1,921,000 barrels during the week and now stand at 59,827,000 barrels, highest all-time level. These stocks are 14,476,000 barrels or 31.9 percent higher than those being held at the same time last year, and exceed the peak level of 54,983,000 barrels, reached just before Pearl Harbor, by almost five million barrels.

Residual fuel production of 8,172,000 barrels in the week of September 28, was 14,000 barrels more than was produced in the week before and 918,000 barrels or 12.7 percent over output of last year's like week when 7,254,000 barrels were produced. Stocks of residual were increased by 743,000 barrels during the week and rose to 57,657,000 barrels, high mark for this year. This inventory is 10,197,000 barrels or 21.5 percent more than the 47,460,000 barrels held a year previously.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	54,983	11-15	102,448	1-4
1942	4,337	2-7	3,961	1-3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1-8
1943	4,436	11-13	4,331	12-4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1-2
1944	4,762	9-30	4,798	12-30	240,992	1-1	89,162	4-1	48,162	10-28	64,744	10-7
1945	4,944	7-21	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1-6
1946	[1]4,961	6-15	4,911	8-31	229,430	3-2	105,233	2-16	[1]59,827	9-28	57,657	9-28
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10-7	20,722	4-15	105,397	4-3
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10-4	28,382	4-12	90,914	7-13
1942	3,297	7-4	3,393	5-23	231,896	12-12	75,934	12-5	29,240	4-25	72,962	12-26
1943	3,821	1-9	3,579	3-18	232,191	1-9	68,182	10-16	30,732	4-3	57,596	12-25
1944	4,357	1-1	4,228	2-12	220,258	9-9	76,302	1-1	30,232	4-19	49,737	3-18
1945	3,621	10-6	3,409	10-6	[4]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3-9	4,498	1-12	218,193	1-5	85,324	9-28	25,131	3-9	37,289	4-6

TRENDS OF 1945 AND 1946

Trends In Week Ended	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1945:									
January 27	4,727	4,756	221,310	14,957	88,223	4,843	33,561	9,252	51,119
February 24	4,777	4,803	219,351	15,500	95,972	4,958	28,753	9,084	46,713
March 31	4,781	4,677	223,782	14,644	98,758	4,548	26,889	9,184	41,745
April 28	4,805	4,780	223,474	14,633	94,068	4,636	28,273	9,379	39,813
May 26	4,887	4,950	222,831	15,194	89,121	4,667	29,184	9,670	38,548
June 30	4,903	4,999	220,781	15,546	86,472	4,910	32,213	9,077	40,488
July 28	4,930	4,996	218,507	16,106	86,008	4,598	36,071	9,586	42,283
August 25	4,892	4,931	[4]211,813	15,986	84,693	4,960	39,782	9,356	46,201
September 29	4,357	3,812	222,387	11,913	79,552	3,940	43,689	7,047	46,853
October 27	4,273	4,838	224,230	15,530	74,335	5,159	43,472	8,691	45,943
November 24	4,469	4,648	219,363	15,681	83,184	4,802	45,258	8,800	47,474
December 29	4,474	4,729	218,918	14,546	95,205	5,055	36,651	8,765	42,447
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,293	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,322	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,447
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 7	4,800	4,881	223,132	15,263	86,911	5,625	54,721	8,313	54,786
September 14	4,773	4,892	221,903	14,796	86,818	5,687	56,204	8,419	55,736
September 21	4,775	4,785	222,664	14,724	85,854	5,450	57,906	8,158	56,914
Sept. 28, 1946	4,778	4,829	.....	14,675	85,324	5,832	59,827	8,172	57,657
Sept. 29, 1945	4,357	3,761	[5]215,417	11,616	76,210	4,048	45,351	7,254	47,460
Change:									
In Week	+3	+44	+761	—49	—530	+382	+1,921	+14	+743
In Year	+421	+1,068	+7,247	+3,059	+9,114	+1,784	+14,476	+918	+10,197
In Year	+9.7%	+28.4%	+3.4%	+26.3%	+12.0%	+44.1%	+31.9%	+12.7%	+21.5%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922 due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, September 22, 1945.

Stanolind's Rangely Purchases Dropped to 175 Barrels Daily

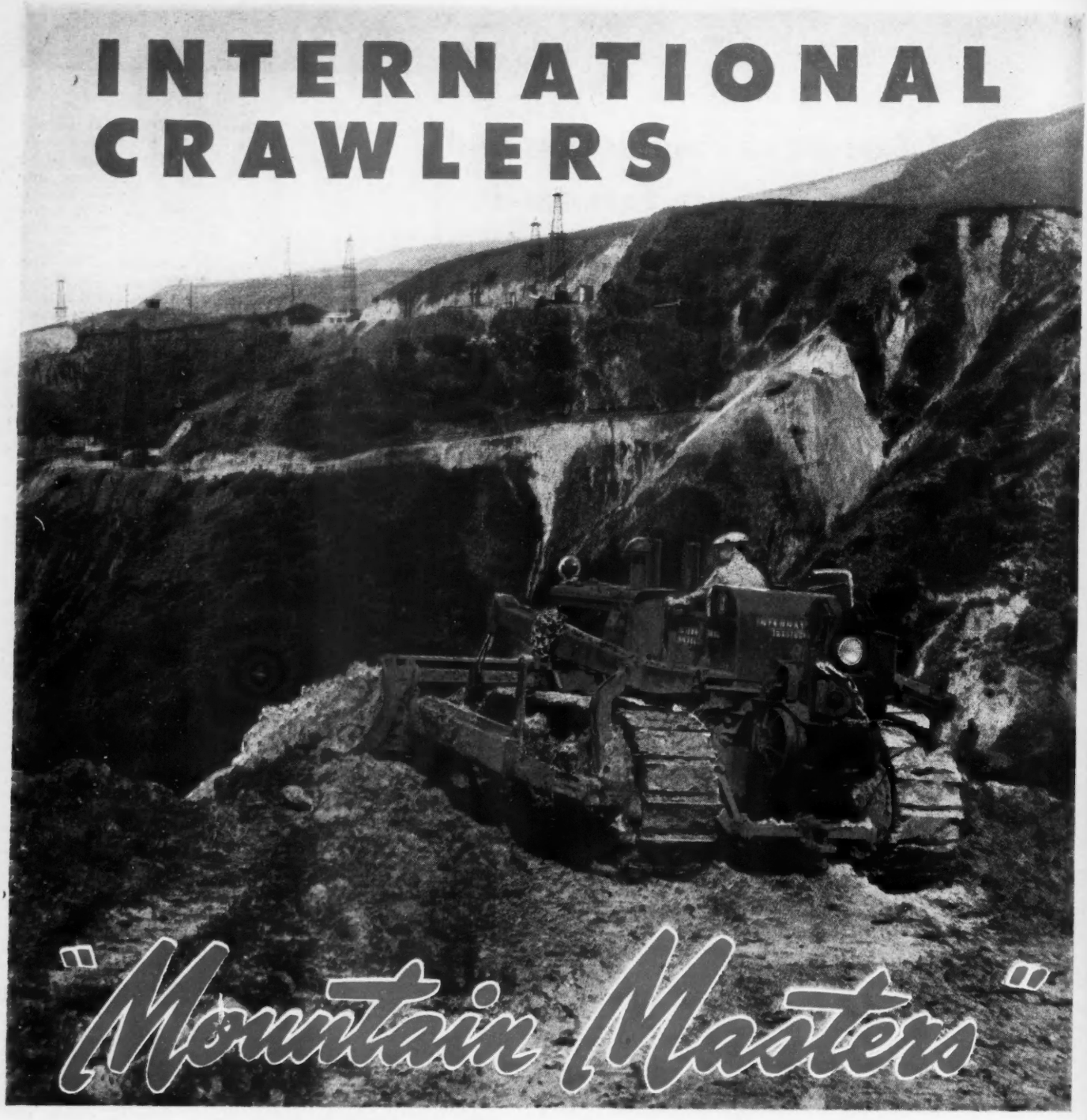
The pipe line allotment from Rangely field, Colorado, has again been reduced and beginning October 1 Stanolind is only purchasing 175 barrels per day from each well. During September the runs were at 200 barrels per day. There are now 130 wells completed at Rangely in the Weber sand, and 53 rigs are running in the field. Total field production will remain at around 26,000 barrels per day during October.

Present pipe line capacity for the one pipe line from the field is 26,400 barrels and crude is being delivered to the following refineries: Utah Oil & Refining, Salt Lake City; Wasatch Refinery, Woods Cross, Utah; Idaho Refining Company, Pocatello; The Texas Company's refinery, Casper, Wyo.; Oriental Refinery, Denver; Perry Refinery (Skelly), Denver; Frontier Refinery, Cheyenne; Co-Op Refinery, Scottsbluff; and to Eastern Markets through the Stanolind pipe line to Freeman, Mo.

Indian Leases Offered

Sealed bids for oil and gas leases on 22,732.33 acres of restricted Indian lands in Oklahoma will be opened at the Kiowa Indian Agency, Anadarko, Okla., at 10 a.m., October 16. Leases offered are in Caddo, Comanche, Cotton and Stephens counties.

INTERNATIONAL CRAWLERS



• Need a *"Mountain Master?"* Well, here's another job where INTERNATIONAL CRAWLERS have been *performance proven!* They carve access roads and shelves from the mountain sides. They mop up landslides and spot heavy equipment. Before the drillers can turn a hand, these "Mountain Masters" are hard at work preparing the way.

The INTERNATIONAL TD-18, above, gives you 16 tons of balanced weight and positive traction. It's powered by a big, *full-Diesel* engine, famous for durability and economy of operation. The result is *maximum power at bulldozer or drawbar.*

Built to meet all extremes of weather and terrain, INTERNATIONAL CRAWLERS give more dependable power at minimum operating cost.

Visit the International Industrial Power Distributor in your locality. He has complete information and operating data on INTERNATIONAL CRAWLER TRACTORS.

Industrial Power Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue — Chicago 1, Illinois

INTERNATIONAL HARVESTER

INTERNATIONAL
Industrial Power
CRAWLER TRACTORS • POWER UNITS • WHEEL TRACTORS

☆ Oklahoma

Oil Pool Opened Southwest Of Temple in Cotton County

Oil pool opened southwest of Temple; 3 producers completed in new Simon pool; Oakwood test to plug back to test upper shows; Carter completes Eskridge in Bromide; Coon Creek field defined on south; Wewoka Northeast pool given north extension; Skelly completes good well in Velma pool; gas area opened near Chandler.

Cotton County: An oil pool apparently has been opened between the townsite of Temple and the Cache Creek pool by L. H. Choate's Shelby 1, NW NW SE 5-4s-10w. Sand pay was topped at 1348 feet, and from 1348-50 feet the well flowed by heads and is being put on pump. Estimated production has been set at approximately 250 barrels of oil per day. Approximately ½ mile east of the discovery well, William Ungerman's Campbell 1, NW SW NW 4-4s-10w, was drilling in saturated sand, topped at 1389 feet. This well is about 3 locations south of a 3400-foot failure.

Three new producers have been completed in the new Simon oil field, 9 miles southwest of Walters. They are S. D. Johnson & Alco Valve Company's Simon 1, the discovery, in NE SE NW 9-3s-11w, which had sand at 1580 to 1615 feet; Johnson Oil et al's Simon 2, in SE SE NW 9-3s-11w, which encountered the sand pay at 1580-1620 feet; and Johnson and Acme Dies Machine Company's Cooper 2, in NW SE NE 9-3s-11w, which topped the sand at 1584 feet, with total depth 1728 feet. Production for the Simon 1 and 2 has been estimated at approximately 300 barrels of oil per day, but the Cooper's production has not been estimated.

Dewey County: The Oklahoma Natural Gas Company was to plug back Oakwood Unit 1, NW NW NW 6-17n-14w, near Oakwood townsite, to test shows up the hole. Present total depth of the closely-watched wildcat is 12,610 feet. The second Wilcox sand was based at 12,590 feet. On a drill-stem test of sand at 7951-82 feet, a recovery of 120 feet of oil-cut mud was made, with a small show of free oil.

Garvin County: The Carter Oil Company has completed Eskridge 1, NE NW SW 19-4n-2w, new zone-opener and extensioner for the Southwest Maysville pool, as an oil well in the second Bromide zone. Latest gauge showed 76.4 barrels of 64-gravity distillate flowing in 12 hours through ¼-inch choke from 7312-45 feet. Tubing pressure was 2500 pounds with separator pressure 150 pounds. Gas was gauged at 2,075,000 cubic feet daily for a gas-oil ratio of 13,000/1. The company has staked Eskridge 2, NE SW SW of 19-4n-2w.

Coon Creek Area: A. R. Jordan apparently has defined the south edge of the productive Coon Creek field, which is on the Oklahoma-Logan County border, with Helfrich 1, NW NW NE 10-14n-1w. The well was put on pump after swabbing 200 barrels of oil and 100 barrels of water from the Second Wilcox. The east edge of the field was defined earlier by Phillips Petroleum Company's Umpleby 1, NW NW NW 2-14n-1w, abandoned at 5975 feet.

Seminole County: The Wewoka Northeast pool has been given an extension ½ mile north by R. W. Brown's Fore 1, SW NE NW 16-8n-8e, north of Wewoka townsite. The well drilled with rotary to 3977 feet, in Woodford shale, where 7-inch casing was set. Misener sand was topped at 3988 feet, and a good show of oil was recovered on a test from 3988-4000 feet. Testing continued, with estimates of production ranging from 300 to 500 barrels of oil per day.

Stephens County: Another producer has been added to the prolific Velma pool by Skelley Oil Company. Dickerson Unit 4, NE SE NW 25-1s-5w, now shut in for connections, was gauged for 330 barrels of oil in 24 hours from total depth of 3079 feet. The company was rigging up rotary for a new start at Frensley-G 3, NW SW NE Sect. 25.

Lincoln County: A new gas area near Chandler has been opened by Olson Drilling Company et al's Masten 1, NW SE SW 35-14n-4e. The well, 1½ miles east of Cleveland sand oil production, made 7 million cubic feet of gas on a drill-stem test at total depth of 3022 feet in the Cleveland sand. Seven-inch casing was landed at 2995 feet and crew is waiting for cement to set. The firm and associates have a block of 2000 acres around the well site.

☆ Kansas

Pawnee County Rutherford Pool Gets North Extension

Rutherford pool extended north; Wellington pool gets 60-barrel producer; Cities Service Oil Com ıy stakes wildcat in Ellsworth Count ; Butler County wildcat abandoned in Mississippi lime; prospective extensioner for Webster pool flows 109 barrels of oil in 12 hours.

Pawnee County: Sunray Oil Corporation has given the new Rutherford pool an extension ½ mile north at Almquist

Wells Completed in the United States in Week Ended October 5, 1946

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second or third issue of each month. More detailed data on wildcats published in third or fourth issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Alabama	....	....	....	....	....	....	....	....	1	1	1	....	13	27
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Arkansas	3	....	....	....	3	....	....	....	....	....	3	2	141	145
California	23	2	....	1	26	....	....	....	4	4	30	27	1,398	1,666
Colorado	4	....	....	....	4	....	....	....	1	1	5	3	116	31
Florida	....	....	....	....	....	....	....	....	1	1	1	2	20	11
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	2	6
Illinois	40	1	....	17	58	3	1	1	22	24	85	60	1,648	1,467
Indiana	6	....	....	3	9	....	....	....	4	4	13	12	363	260
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Kansas	19	13	....	3	35	1	....	....	4	4	40	43	1,558	1,289
Kentucky	4	....	....	3	7	....	....	....	2	2	9	4	482	468
Louisiana	17	....	....	6	23	....	1	2	7	10	33	30	995	795
North Louisiana	12	....	....	5	17	....	....	1	3	4	21	18	564	308
South Louisiana	5	....	....	1	6	....	1	1	4	6	12	12	431	487
Michigan	5	1	....	6	12	....	....	1	3	4	16	15	597	589
Mississippi	4	....	....	1	5	....	1	....	1	2	7	5	172	293
Missouri	....	....	....	....	....	....	....	....	....	....	....	....	22	41
Montana	5	....	....	2	7	....	1	....	....	1	8	1	200	173
Nebraska	....	....	....	....	....	....	....	....	....	....	....	....	3	3
New Mexico	4	1	....	1	6	....	....	....	....	....	6	13	325	327
New York	15	1	10	....	26	....	....	....	....	....	26	25	912	872
North Carolina	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Ohio	9	12	....	5	26	1	1	....	1	2	29	34	933	745
Oklahoma	50	2	1	19	72	1	1	....	22	23	96	53	2,189	1,802
Oregon	....	....	....	....	....	....	....	....	....	....	....	....	2	....
Pennsylvania	27	4	15	2	48	1	....	....	....	....	49	51	2,408	2,270
South Dakota	....	....	....	....	....	....	....	....	....	....	....	1	1	....
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	2	3
Texas	72	7	2	19	100	1	8	1	28	37	138	151	6,155	5,590
E.Tex.Bor. Co.'s	....	1	....	1	2	....	....	....	....	....	2	....	129	80
Rest of E. Texas	3	....	....	1	4	....	....	....	3	3	7	10	411	174
North Texas	13	....	2	6	21	1	1	....	5	6	28	40	1,737	1,343
W. Central Tex.	5	1	....	4	10	....	2	....	4	6	16	13	492	370
West Texas	28	....	....	3	31	....	1	....	7	8	39	37	1,324	1,355
Tex. Panhandle	3	3	....	....	6	....	....	....	....	....	6	8	281	474
G. Coast, Upper	6	1	....	2	9	....	3	1	3	7	16	14	503	539
G. Coast, Lower	10	1	....	....	11	....	1	....	3	4	15	20	835	799
Southwest Texas	3	....	....	2	5	....	....	....	1	1	6	6	317	383
S. Central Tex.	1	....	....	....	1	....	....	....	2	2	3	3	126	73
Utah	....	....	....	....	....	....	....	....	....	....	....	....	3	....
Virginia	....	....	....	....	....	....	....	....	....	....	....	....	2	....
Washington	....	....	....	....	....	....	....	....	....	....	....	....	1	1
West Virginia	....	13	....	3	16	....	....	....	....	....	16	23	563	617
Wyoming	2	....	....	....	2	....	....	....	....	....	2	3	120	124
Total U. S.	309	57	28	91	485	8	14	5	101	120	613	558	21,348	19,616

* Includes distillate wells. † Includes salt water disposal wells.

1, SW SE SW 5-20s-16w. The well pumped 8 barrels of oil per hour for 8 hours from the Arbuckle at 3799 feet, thus proving production from the formation.

Sumner County: A 60-barrel producer has been brought in for the Wellington pool by Stelbar Oil Corporation. Moore 1, SW SW SW 5-32s-1w, is producing from the Mississippi chat from 3641-74 feet. Formation was topped at 3640 feet, and total depth is 3674 feet.

Ellsworth County: Location has been staked by Cities Service for a 3500-foot wildcat. It is Coon 1 "B," NE NE SW 19-14s-10w, about 10 miles north of the northwest sector of the Stoltenberg pool. Nearest production is in the Stoltenberg pool.

Butler County: Dunn & Strait's Kister 1, SW SW NE 27-26s-6e, wildcat 2 miles east of the Garden pool, has been abandoned after failing to log commercial shows. Total depth was 2829 feet in the Mississippi lime, with hole full of water. Mississippi was topped at 2804 feet; Lancing lime at 1835 feet, and Kansas City lime at 2145 feet.

Rooks County: Shell Oil Company's Veverka 1, NW SE SE 21-8s-19w, prospective extensioner northward for the Webster pool, flowed 109 barrels of oil in 12 hours from the Arbuckle lime on a recent drill-stem test, thus proving production north of the Webster area. Pay was from 3440-50 feet, with total depth 3450 feet. On a previous test the well swabbed 15 barrels of oil per hour.

☆ New Mexico

Chaves Ordovician Prospect Is High on Pennsylvanian

Chaves County Ordovician prospect correlates high on Pennsylvanian; Curry County wildcat nearing decisive level; Yeso production in Eunice townsite area expanded a mile northwest, and field has 40 to 50 proved undrilled locations.

Chaves County: Magnolia Petroleum Company's Black Hill's Unit 1, C NW NE 31-17s-20e, cemented protection pipe at 4439 feet in Pennsylvanian, topped near the 4380-foot level. This wildcat is high for the general area, and is due to explore the Ellenburger, which was not reached by preivous deep tests due to granite.

Curry County: Humble Oil & Refining Company's Northcutt 1, 1½ miles northwest of its 7805-foot granite failure in Deaf Smith County, Texas, was circulating for samples in Pennsylvanian at 6264 feet. The nearby failure had nominal shows in several zones, but failed to respond to acid treatment.

Lea County: Barnsdall Oil Company's Hardy 1, C SE NE 29-21s-37e, deepened shallow producer, extended the Yeso pay in the Eunice townsite area a mile north by west in flowing 162 barrels of oil natural on ¼-inch choke from open hole at 6520-6652 feet. Magnolia's Carson 9, nearest producer, flowed 768 barrels, with gas-oil ratio 152/1, initial through open tubing after acidizing 3 zones of perforations between 6529 and 6601 feet. This area is officially prorated as the Drinkard field, due to similarity of pay zones, but the Drinkard field is a separate structure. The Yeso zone in the Eunice townsite area promises to become the most important of the middle and lower Permian fields, and 40 to 50 proved locations remain to be drilled. An overlap of the Paddock, or Glorietta pay into the Eunice townsite area was revealed when The Ohio Oil Company's Owen 2, C SW SW 35-21s-37e, recovered 1012 feet of oil and 276 feet of oil and gas-cut mud when tester was used in the Glorietta at 5160-5210 feet. It will continue to the Yeso.

Hobbs Field: Sun Oil Company's McKinley 1-B, depleted San Andres producer on the northeast edge of the structure, tested water at 5596-5580 feet in the Glorietta, and was drilling at 5820 feet. It is the first deep test for the structure.

☆ West Texas

North Goldsmith Ellenburger Discovery Has Prolific Flow

Ellenburger discovery on northeast side of the North Goldsmith field makes prolific oil flow; Silurian pay discovery on same structure showing water with oil flow; Dollar Hide field expanded northwest; Glasscock County strike is district's first Mississippian producer; field operations continue to expand.

Ector County: Humble Oil & Refining Company's Cowden 1-B, C NE NE T&P Ry. 11, Block 45, T-2-N, 1⅞ miles northeast of Devonian production in the North Goldsmith field, flowed 66½ barrels of 44.2-gravity oil, with gas-oil ratio 358/1, on 1-hour gauge through ½-inch after washing with 500 gallons of acid. This strike is producing from perforations at 8545-85 feet in Ellenburger, topped at 8548 feet, with elevation 3289 feet. Base of the Permian was called at 7720 feet, or 117 feet higher than the previous highest well, while the Devonian and Silurian section were absent. Humble has started north and east offsets, and a ½-mile south outpost.

Phillips Petroleum Company's Cowden-Bum 1, ⅓ mile southeast of the Devonian discovery for the North Goldsmith field, flowed 239 barrels of fluid, averaging 92 percent oil and the balance bottom sediment and water, on 12-hour gauge through ½-inch choke, with gas-oil ratio 1242/1, after using 500 gallons of acid through perforations at 8255-80 feet. Production is from the Silurian, topped at 7900 feet, with elevation 3302 feet. The Devonian was missed. It is the first Silurian producer for the county, although the zone is capable of large natural flow in the TXL field.

Magnolia Petroleum Company's Cowden 5, west offset to the Devonian discovery, was drilling below casing seat at 8060 feet after showing a small amount of free oil on test at 7895-8060 feet in Devonian, topped at 7977 feet, or 52 feet low. Humble's Cowden 1-C, mile north by east of the Devonian discovery, was drilling Simpson at 8645 feet, having logged nominal show of oil in the Devonian, topped at 7990 feet, or 84 feet low. The Devonian pay will not embrace much territory, but the Ellenburger zone is due to become a major source of production.

Andrews County: Humble's Cowden 2, ⅜ mile northwest extension and fourth producer for the Dollard Hide field, flowed 398 barrels of 42.2-gravity oil, gas-oil ratio 1625/1, through ⅜-inch choke after acidizing Devonian perforations at 7670-7725 feet. Pacific Western Oil Corporation's Cowden 1, northwest outpost, flowed 25 barrels of oil hourly through tester at 7690-7740 feet in Devonian, topped at 7690 feet, with elevation 3151 feet, and was running pipe to complete at 7902 feet. The northwest trend is open for further expansion.

Reeves County: Argo Oil Corporation's Roberts 1, wildcat that flowed oil by heads through drill pipe from Wolfcamp broken pay near the 10,700-foot level, was due to set pipe while bottomed in Pennsylvanian sand and shale at 14,053 feet. The Wolfcamp was entered at 10,120 feet, with elevation 2880 feet, and is the thickest known section in the district.

Glasscock County: Shell Oil Company's Clark 1, C NE SW T&P Railway 5, Block 32, T-4-S, first Mississippian discovery for the Permian Basin, was shut in for tankage after flowing 186 barrels of 48-gravity oil and 20 barrels of bs&w, with gas-oil ratio 1895/1, on 9-hour gauge through ½-inch tubing choke. This production was from perforations at 9740-55 feet in Mississippian, topped at 9612 feet with elevation 2663 feet, and the zone was washed with 500 gallons of acid. Clark 1 entered barren Ellenburger at 9838 feet, and Hickory sand at 10,950 feet, while granite was reached at 10,964 feet.

Winkler County: Stanolind Oil & Gas Company and Westbrook-Thompson Holding Corporation's Hendrick 35-A, Hendrick field and prospective deepest discovery in the district, cemented 5½-inch casing at 13,806 feet, or 9 feet off bottom, to test oil saturation and porosity at 13,668-13,738 feet. Ellenburger was entered at 13,385 feet.

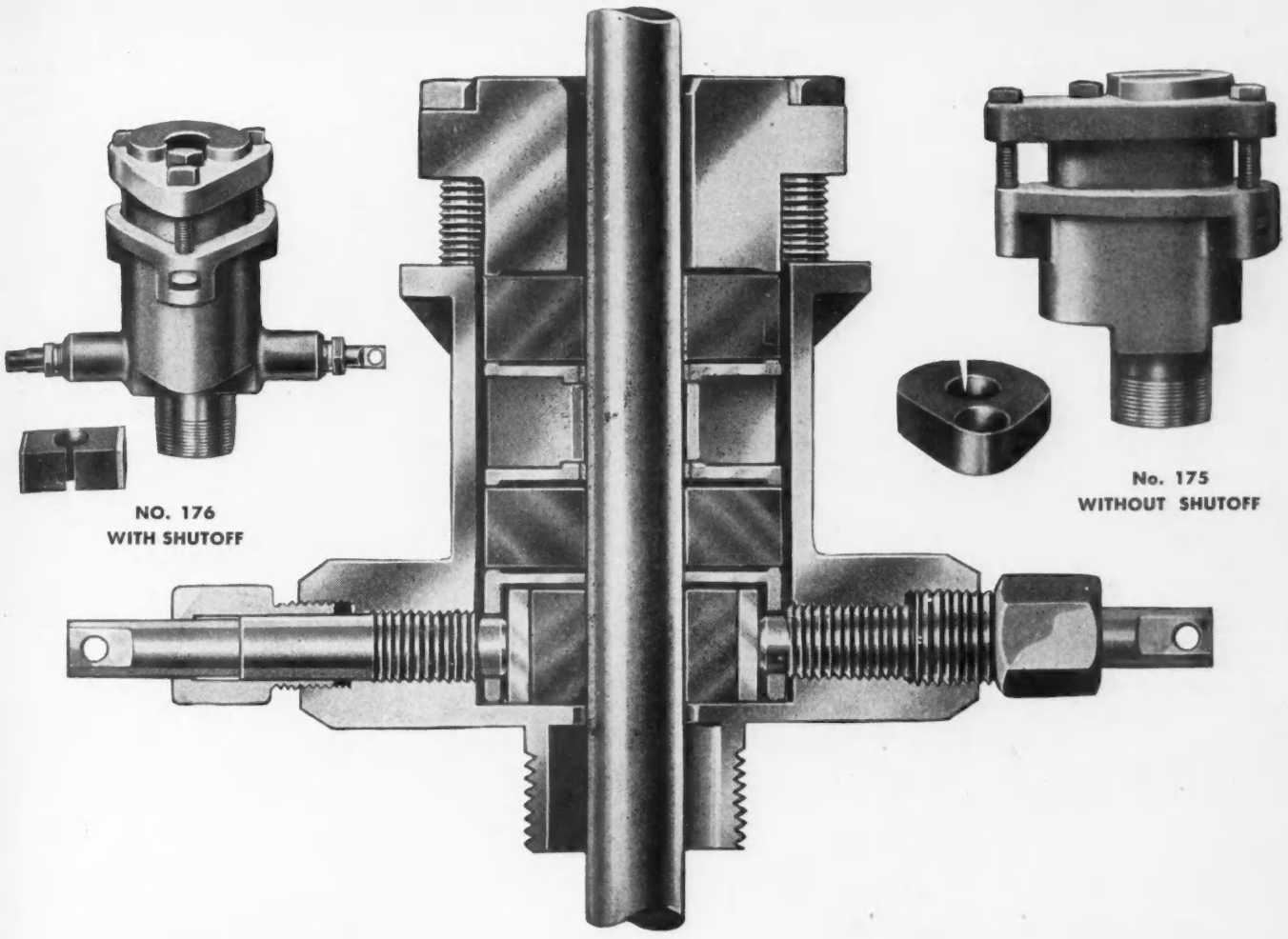
Stanolind's Sealy-Smith 9, west offset to its Glorietta-Holt lime discovery in the Sealy-Smith pool, flowed 351 barrels of 36-gravity oil initial through ¼-inch choke after using 1000 gallons of acid through perforations at 5170-90 feet. The company's Sealy-Smith 12, south offset to the Lowe pool 5200-foot Clear Fork discovery, was awaiting orders at 5366 feet after failing to indicate commercial production in the Glorietta and Upper Clear Fork. The discovery was drilled to 6500 feet.

Extensions: Roy D. Golston et al's Moody 1, C W¼ of E¼ H&TC Ry. 32, Block 34, a mile north by west of production in Ward County, flowed 30 barrels of 31-gravity oil, with gas-oil ratio 320/1, through 6/64-inch choke after nitro shot at 2495-2540 feet, having plugged back from 2775 feet. In Garza County, George & Herman Brown and Comanche Corporation's Post 1-A, Sect. 1228, J. V. Massey Survey, extended the Post area ¾ mile north in pumping 92 barrels of 35.8-gravity oil initial after using 10,000 gallons of acid at 2770-3000 feet, having plugged back from 3415 feet.

Mississippi Board Refuses To Reopen Gwinville Hearing

The Mississippi Oil & Gas Board refused the application of The Superior Oil Company to reopen the hearing on well spacing in the Gwinville field, Jeff Davis County.

The company asked that gas wells be spaced on blocks of 640 acres while land and royalty owners in the area had countered with a request for 160-acre units. The board, however, ruled last month that it would abide by its original 320-acre spacing rule.



RATIGAN *Self Oiling* STUFFING BOXES

SELF ALIGNING POLISHING ROD
TESTED TO 3,000 POUNDS
LUBRICATE DIRECT FROM PUMPING WELL
FINEST MATERIALS

Ratigan stuffing boxes are the only self-oiling stuffing boxes on the market. They receive their lubrication directly from the pumping well.

Ratigan No. 175 and No. 176 Stuffing Boxes are identical except that the No. 175 has no shutoff feature.

The hole in the rubber is made for the size of the polished rod; while the hole in the metal parts of the body are larger; a design that makes the rod self-aligning.

The inside of the box is removable, so that the device has two oil chambers. Another arrangement inside the body keeps the two chambers filled with fluid from the well. This method of self-lubrication, without depending on the human element, is an excellent feature in itself.

The Ratigan No. 176 Stuffing Box can be shut off while repacking the box, by tightening the screws evenly in the shutoff; but caution must be exercised, as the screws will have to be loosened before the well starts to pump. If not, the fluid will not get up into the stuffing box.

When the screws are not tight against the rubber, the stuffing box is free to function properly. For a further check on the fluid coming up through the bypass, the pumper may loosen the plug in the cap a little, and if the bypass is free the oil will flow immediately. If the oil does not come through, the screws in the shutoff are too tight.

When repacking Ratigan Stuffing Boxes, both rubbers must be removed; instructions for installing are supplied to oil companies and supply stores on request, and are attached to all foreign shipments. When ordering, specify size and type of thread, and size of polished rod.

All Ratigan products are illustrated and described in the 1946-47 edition of The Composite Catalog.

J. P. RATIGAN

1213 South Santa Fe Avenue, Los Angeles 21, California

RATIGAN PRODUCTS ARE SOLD THROUGH LEADING SUPPLY STORES

☆ North Texas

Wildcat Probes Ellenburger; Has Pennsylvanian Production

Haskell County wildcat exploring Ellenburger after indicating production in Pennsylvanian; Canyon lime discovery noted in Wilbarger County; production test pending for Montague County prospect.

Haskell County: Thomas D. Humphrey's Chapman 1, northeast corner of Block 60, H. Tidwell Survey, and 3 miles northeast of the Lawson field, is drilling below 5000 feet to explore the Ellenburger before running pipe for production test. This wildcat is supported by a block of 15,000 acres, and logged effective oil saturation in the Adams Branch near the 2500-foot level, while it is credited with having indicated production possibilities from deeper sands. A major pipe line company has promised to enter the Lawson field and also this area if a commercial producer occurs.

Wilbarger County: Ed Lawson and Anderson-Prichard Oil Corporation's Baker 2, SW SW NE H&TC Ry. 85, Block 14, 2¼ miles southeast of the victory pool and on a strike with an older area, is rated a 150-barrel pumper from open hole at 3306-10 feet in Canyon, topped at 3245 feet.

Montague County: Honolulu Oil Corporation's Cooke 1, J. W. Carter Survey, and more than a mile northwest of the Bowers field, cemented 7-inch pipe at 3463 feet after drilling to 4368 feet, and will attempt to complete in oil sand at 3400-14 feet.

☆ East Texas

Leon County Prospect Has Good Structural Position

Leon County prospect registers favorable structural position; deep Woodbine wildcat in Houston County nearing decisive level; Mount Sylvan field assured of second Paluxy producer.

Leon County: J. B. Daniel Oil Company's Cox 1, John Critchfield Survey and 1½ miles west by south of Claude Bell's small Woodbine pumper, was drilling shale at 7070 feet, with the first sand series due near this level. It is credited with correlating about 20 feet high to the incomplete discovery, and logged Pecan chalk at 5304-5535 feet and Austin at 6307-6604 feet.

Houston County: John Ivy and W. T. Moran's Murray 3, John Durst Survey and on the block that revealed thick sand beds in the Woodbine thus precipitating a major lease campaign several years ago, was drilling shale at 7070 feet. The Austin chalk was entered near the 7500-foot level, with elevation 188 feet. Owners plan to explore the Edwards if the Woodbine is barren. Magnolia Petroleum Company's Southern Pine 1-A, Leonard Williams Survey and 2 miles southeast of Weches, was drilling Georgetown lime at 7380 feet. This wildcat logged nominal show of gas with water at 5956-86 feet.

Smith County: Humble Oil & Refining Company's Moseley 1, northwest offset to its Mount Sylvan field discovery, was awaiting swabbing truck after failing to flow natural from Paluxy perforations at 7360-70 feet. Previous perforations at a lower level yielded oil and water, and a commercial producer is assured. However, the effective pay zone is not as thick as the discovery.

Wood County: Humble's McKnight 1, deep test for the northeast flank of the Hawkins field, was halted at 9143 feet in sandy shale to run electrical log and take sidewall cores. This wildcat tested water in Woodbine and Paluxy, topped at 4801 feet and 6718 feet, respectively.

Titus County: Humble's Guaranty Bank 1, William Watts Survey, Paluxy prospect for the secondary fault trend to the north of the Talco field, was drilling at 4830 feet in Georgetown, topped at 3850 feet. Nominal porosity logged in the Georgetown, which has yielded a small amount of oil in the Hawkins field, tested 28 feet of oil- and gas-cut mud at 4136-79 feet.

Cherokee County: Standard Oil Company of Texas' New Birmingham 1, projected Travis Peak wildcat, entered water sand at 4865 feet in Woodbine, topped at 4851 feet with elevation of 478 feet, and was drilling at 4990 feet.

Marion County: Snowden Oil & Gas Company has asked for a discovery allowable for W. J. Sedberry 1, Martin G. Nall Survey, Smithland field. Operators say the well is producing from the Paluxy through perforations at 2420-30 feet, and that previous production has been from the Tokio sand, a shallower pay. The well is flowing 480 barrels of 44.3-gravity oil daily through ⅜-inch choke. Snowden has completed 2 more Paluxy producers in the field, and Trimount Oil Company has drilled an east offset, logging prospective pay at the lower interval. The area is developed on a small spacing pattern, with daily allowable being 50 barrels per day.

Secondary Recovery Meet

New trends in improved secondary recovery methods will be aired at the tenth annual Secondary Recovery Conference at The Pennsylvania State College, November 1 and 2. The Pennsylvania Grade Crude Oil Association, a sponsor of research projects at the college, is cooperating.

Technical sessions, on Friday afternoon and Saturday morning, will feature reports of progress made in studies related to recovery of petroleum by water flooding and air-gas drive.

Wimberly Selected

The FPC has designated Harrington Wimberly as its official representative on the Interstate Oil Compact Commission. This is the first federal agency to designate an official representative on the Compact following amendment of the commission's by-laws authorizing such appointment by any governmental agency charged with responsibility concerning oil and gas.

Production Practices Book

The Interstate Oil Compact Commission's book on production practices being prepared by its engineering committee is taking form officials have announced. Dr. E. DeGolyer, committee chairman who is supervising the writing of the book, will call the committee to meet with industry engineers to study the manuscript prior to its publication.

☆ Southwest Texas

Duval County Prospect Makes Tests After Logging Oil Show

Duval County wildcat tests oil show; North Sun extension area test coring below 4791 feet; Hughes field well completed as oiler.

Duval County: J. W. Gorman et al's Flarence D. Lowe 2, wildcat 1½ miles east-northeast of Labbe field, is making production tests after finding a sand with oil show at 2444-49 feet. On drill-stem test of this sand 1900 feet of salt water and a little oil were recovered. These perforations were squeezed in an attempt to eliminate the water and casing was reperforated at the same interval. Total depth is 2705 feet with 5½-inch casing set to 2480 feet.

Starr County: Sun Oil Company's Lee M. Green 2, North Sun extension area, was coring below 4791 feet in shale. This test is 986 feet north-northwest of the Green 1, discovery well in the extension area, which is 2 miles northeast of Sun field, and 2 miles southeast of North Sun field. The Green 1 flowed 113 barrels of 48.3-gravity oil daily on potential from perforations at 4729-30 feet.

Webb County: Killam-Hurd's J. G. Garcia Heirs 2, 660 feet southwest of the Garcia 1 discovery well at Hughes field, has been completed for a potential of 64 barrels of 21-gravity oil daily on pump. Total depth is 1923 feet with 5½-inch casing set to 1913 feet and perforated for completion at 1871-74 feet.

Mississippi Maps

Copies of field development maps, full size, originally appearing in Factual Data No. 20, Petroleum Engineering Report on the Oil and Gas Reservoirs of Mississippi, Mid-Year, 1946, are now available to members. The maps show sections, townships and ranges, producing, drilling and abandoned well locations, and are posted to October 1. Blue Line Paper Prints of Baxterville, Brookhaven, Carthage Point, Cranfield, Eucutta, Fayette, Gwinville, Heidelberg, Hub, Langsdale, Pickens, SoSo, and Tinsley may be obtained from the Mississippi Oil & Gas Engineering Committee, 301 Tower Building, Jackson, Miss., or directly from the Riley Blue Print Company in Jackson. The cost of a complete set is $14.91.

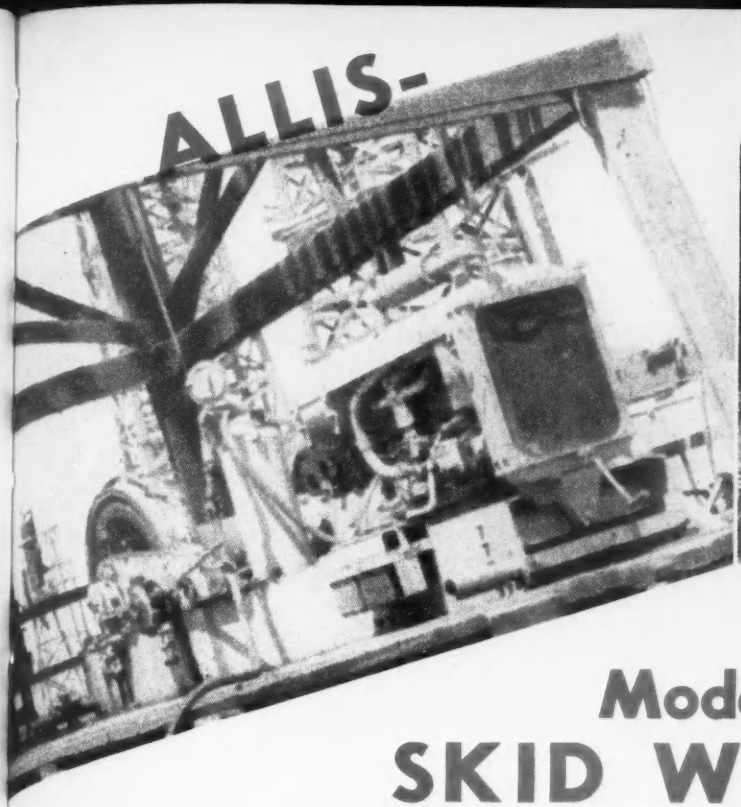
☆ South Central Texas

Charlotte Area Wildcat Has Water on Drill-Stem Test

Charlotte area wildcat recovers salt water on drill-stem test; southeast extension test at Charlotte abandoned; Luling test has 1000 feet of oil in hole.

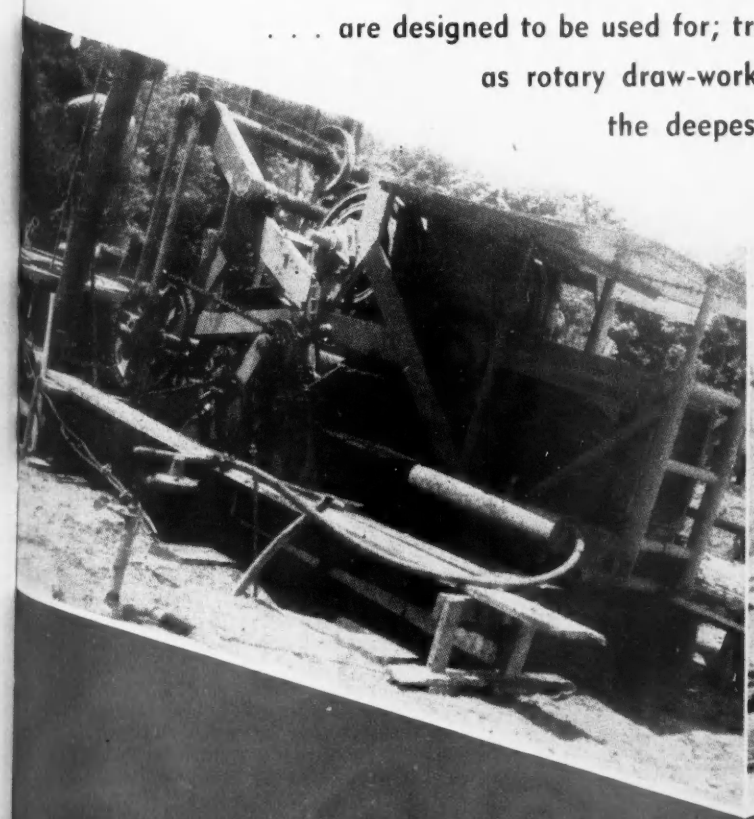
Atascosa County: Humble Oil & Refining Company's Edward Natocha 1, wildcat 2 miles east of Charlotte on the Dobrowolski prospect, ran a drill-stem test at 7189-97 feet in the top of the Edwards lime and recovered 750 feet of salt water. The wildcat was drilling below 7238 feet in lime.

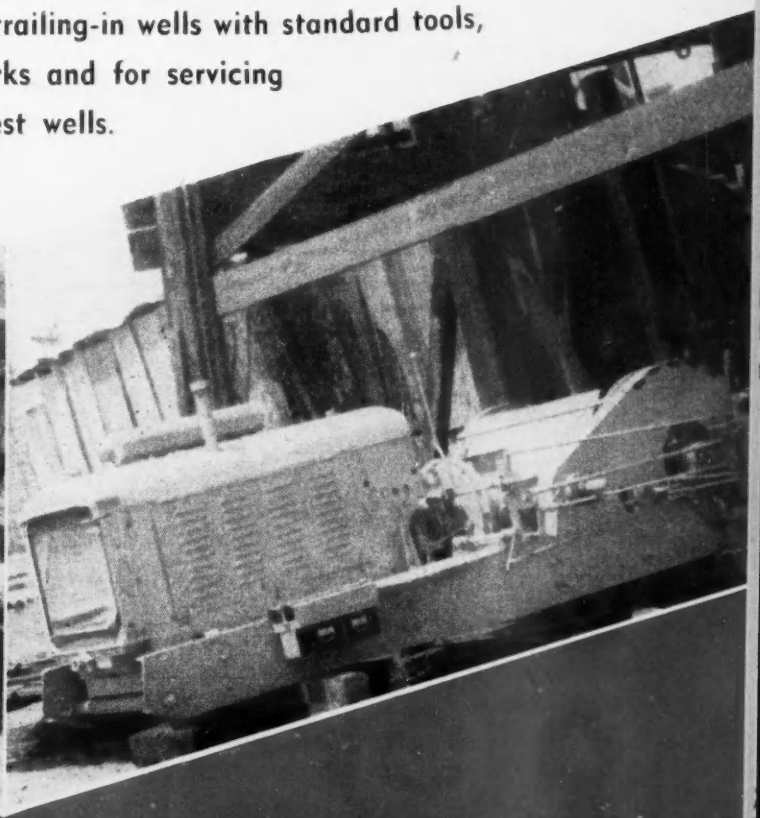
The Texas Company's Earl D. Scott 1, southeast extension test at Charlotte field, has been abandoned. A drill-stem test made at 5294-5305 feet recovered mud with a little mud and another at 5305-28 feet was dry. Another was made



Model L
SKID WINCHES

. . . are designed to be used for; trailing-in wells with standard tools, as rotary draw-works and for servicing the deepest wells.





The Model L844 SKID WINCHES are unsurpassed as long line machines. The transmission is especially designed and manufactured for extra heavy duty service. Maximum line pull is 56,700 lbs. Six cylinder valve-in-head engine develops 590 ft. lbs. torque.

The Model L844 is available with: 42" or 52" diameter brake drums, as single or double drum units. The 42" has a line capacity of 20,610' of ½" line, the 52" has a capacity of 28,200' of ½" line. These units can be furnished with cross-arm spudder, rotary drive and cathead equipment. Single or two pole telescoping masts are available for all units.

May we submit complete specifications?

FRED E. Cooper

Hale Station, TULSA, OKLAHOMA

at 5293-5325 feet and the well acidized with 500 gallons after which it swabbed salt water with a little oil. Total depth is 5404 feet. This test is a mile south-southeast of the same company's Love 1, southeast extension well for the field.

Caldwell County: Magnolia Petroleum Company's T. C. Gideon 13-A, 564 feet south of the Gideon 5-A in Luling field, is testing with 1000 feet of oil in the hole after drilling to 2146 feet, 3 feet into the Edwards lime. Test is being made from open hole with 7-inch casing set to 2141 feet.

☆ Lower Texas Coast

Bee County Strauch-Wilcox Test Makes Production Try

Strauch-Wilcox test making production try; casing set in wildcat northeast of Lucas gas field; 2 recently discovered fields in district named.

Bee County: Mills Bennett's C. G. Rice 1, southwest of the Strauch-Wilcox discovery well, has 7-inch casing set to 8267 feet for production try. The Luling discovery pay zone was topped low at 8200 feet and a drill-stem test at 8201-05 feet developed 5 pounds working pressure in 20 minutes. With 2000 feet of water cushion, 11 stands of cushion cut with condensate were recovered. Bottom hole pressure flowing was 1150 pounds and shut in, 4200 pounds. Drill-stem test at 8205-15 feet, with 2000 feet of water cushion, recovered water cushion cut with oil and 6 stands of salt water. The hole was then drilled to 8275 feet and casing set for completion in the Slick sand, topped at 8000 feet.

Live Oak County: Henshaw Brothers & E. H. Smith's H. N. Schwartz et al 1, wildcat 2 miles northeast of the Lucas gas field, is reported to have casing set with total depth of 4495 feet and will make production tests near that level. This test is 330 feet from the southeast and southwest lines of a 200-acre lease.

Nueces and San Patricio Counties: The nomenclature committee of the South Texas Geological Society has named 2 fields in the district. The field discovered by H. R. Smith & W. C. McBride's E. G. Whitten 1, in Matias Garcia "Palo Alto" Grant A-116, Nueces County, has been named Bishop. East Taft is the name given the field discovered by Claud B. Hamill's R. B. Sweatt 1, about 2 miles east-southeast of Taft field in San Patricio County.

East Texas API

The East Texas Chapter of the API will hold its fall meeting on October 15 in Kilgore and William R. Boyd, Jr., president of the API, will address the group. A discussion of gas conservation will be given by a representative of the Texas Railroad Commission.

☆ Upper Texas Coast

Orange County Discovery Has Flow of 12 Barrels Hourly

Orange County discovery flows 11.75 barrels of oil hourly; Magnolia's Tidehaven confirmation test tops discovery sand high; Ohio's test in Tidehaven area cores at 8200-foot level with no shows; Damon Mound west side test recovers salt water on drill-stem test.

Orange County: Hinkle Drilling Company's Adcock 1, discovery well in the John Stephenson Survey northwest of the Port Neches field, is being completed as an excellent oil well after successfully cutting back the gas-oil ratio. Original perforations at 8774-78 feet were squeezed off and casing was reperforated at the same interval. On latest test the well flowed 11.75 barrels of 37.4-gravity oil hourly with no water through ⅛-inch choke with 1300 pounds flowing pressure on tubing and gas-oil ratio was cut back to 694/1 from 8000/1.

Matagorda County: Magnolia Petroleum Company's Live Oak 2, confirmation test north of Magnolia's discovery well in Tidehaven field, topped the pay sand 35 feet high to the discovery with no shows of oil or gas. This well is 1512 feet north of the discovery well and operators believe a fault lies between the 2 tests. At last report drilling continued in the test below 9560 feet with projected total depth of 10,000 feet.

Another operation in the Tidehaven area is The Ohio Oil Company's Surkamp 1, located 9700 feet south and a little west of Magnolia's Live Oak 1 discovery well, which cored at the 8200-foot level with no shows. This well is scheduled to 9900 feet.

Brazoria County: General Crude Oil Company's Belle H. Wisdom 7, west side of Damon Mound dome, drilled after showing salt water on drill-stem test at 4471-80 feet. The hole was drilled to 4491 feet where 5½-inch pipe was cemented on bottom and drill-stem test run. When the testing tool was pulled a recovery of 1380 feet of salt water was made with no shows of oil or gas. Scheduled total depth is 5500 feet. This wildcat is 400 feet northwest of the No. 1 dry hole and is 300 feet southeast of the No. 2 dry hole.

☆ South Louisiana

California's Alliance Wildcat Opening New Producing Area

California's Alliance area wildcat opening new producing sector; Egan west edge test cores oil sand; Bon Air extension test completed as oiler; Bay Marchand wildcat at 11,233 feet in salt.

Plaquemines Parish: The California Company's E. P. Brady 4, Unit 4, wildcat in the Alliance area, 19-16s-24e, is reported to have made a successful drill-stem test at 13,476-496 feet with details withheld. Tubing has been run in the hole for a flow test. Drilled to total depth of 14,187 feet, the well has 7-inch casing set to 11,185 feet and 5-inch casing to an undisclosed depth. This well is approximately 3 miles southeast of the discovery in Bayou de Fleur field.

Acadia Parish: Irwin & Hudson's Houssiere-Latrielle 5-B, west edge of production at Egan field, 30-9s-2w, cored oil sand from 9907-25 feet. Sands were cored with no shows in the Camerina at 10,075-105 feet and hole is bottomed at 10,125 feet where a log is being run and pipe set for completion in the 9900-foot sands.

Jeff Davis Parish: Sohio Petroleum Company's Claudius Fontenot 2-A, ¼ mile south extension on the east side of Bon Air field, has been completed as an

Tailspin!

The various P. A. C. groups, organized labor, the Communists and the bureaucrats are taking this country for a ride so disconcerting that no man can keep his hands on his work or his mind on his business. We need a great leader—a man who thinks clearly and speaks eloquently—a Moses who knows that to be lost in the bullrushes is not tantamount to finding a Promised Land.

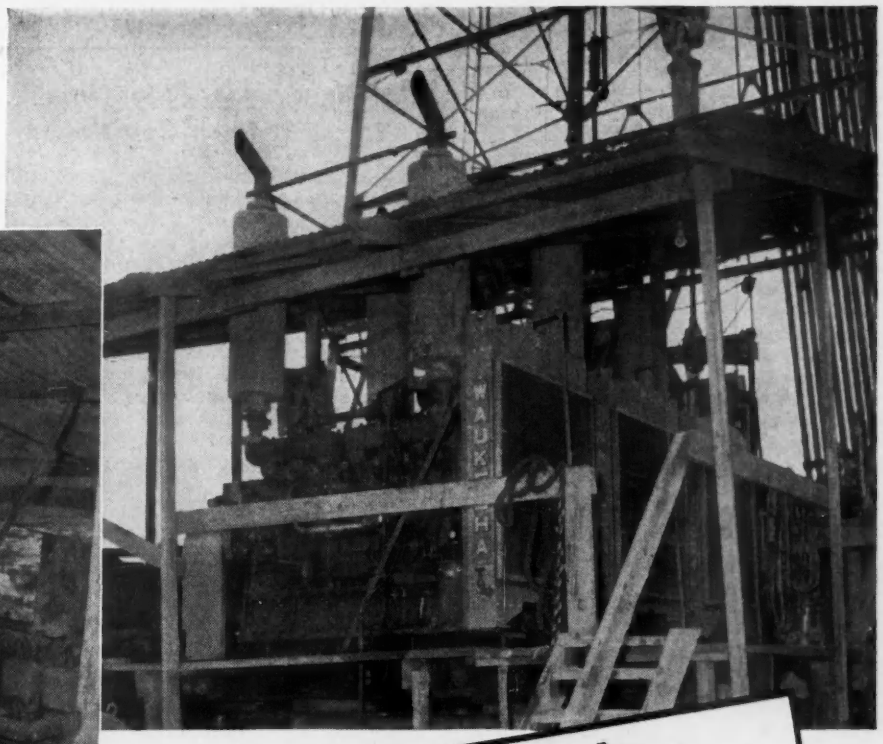
WE'VE SUPPLIED OIL MEN IN OUR AREA FOR 38 YEARS

PELICAN WELL TOOL & SUPPLY CO.

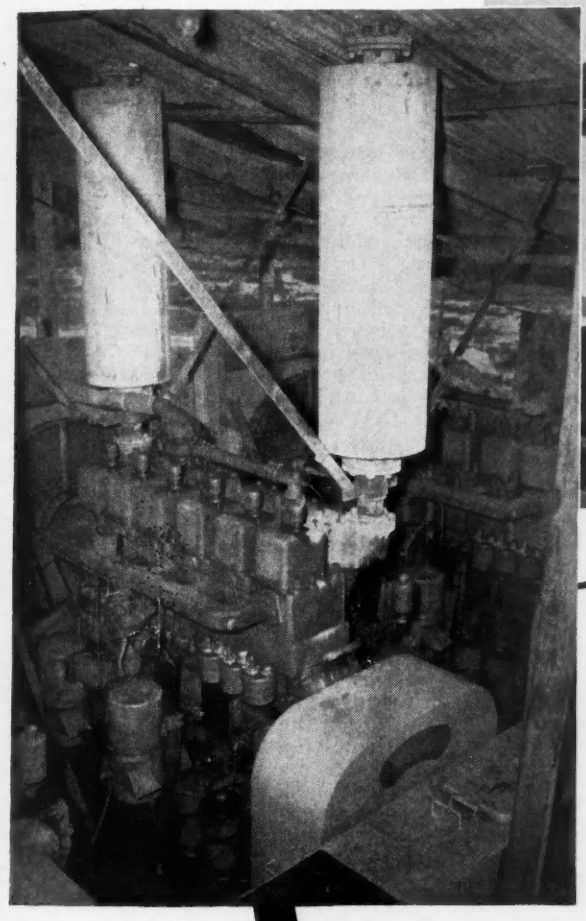
SHREVEPORT
LOUISIANA

PELCO

Berwick
New Iberia
Lake Charles



Wildcatting with three 350 hp. butane-fueled 6-LRO Waukesha Engines, 8½ x 8½ in., 2894 cu. in. displ. Each engine is mounted on a skid-type sub-base. Unitized compound transmission for draw works and pump drives, connected to engines, is also skid-mounted.



WILDCATTING is *simpler... easier... faster...* with WAUKESHA-POWERED RIG

● Wildcatting in southeastern Louisiana, this new Waukesha-powered Gardner Bros. rig has simplified controls and unitized equipment . . . to make drilling faster, easier, more economical. Prime movers are three 350 hp. butane-burning 6-LRO Waukesha Engines. Draw works and the self-contained, inside mounted transmission form a single unit. Draw works has six forward and two reverse speeds when using the high and low drum shaft clutches. Using hand levers, driller selects any combination of engines desired. Main mud pump, 7⅜" x 20", is belt connected to No. 2 engine. Centrifugal pump, operating from No. 1 engine shaft supplies water for hydraulic brake. A 10 kw. variable-speed generator operates from No. 1 engine shaft, to furnish electricity.

Send for Bulletin 840

WAUKESHA MOTOR CO.
WAUKESHA, WISCONSIN
●
NEW YORK • TULSA • LOS ANGELES

WAUKESHA
OIL FIELD POWER

oil well. On potential the well flowed 162 barrels of 37.4-gravity oil daily through ⅛-inch choke with 1225 pounds flowing pressure and gas-oil ratio of 519/1. Total depth is 9751 feet with saturated sand topped at 9678 feet and perforated for completion at 9686-94 feet.

Lafourche Parish: Union Oil Company of California's City of New Orleans 2, the company's second wildcat on the west side of Bay Marchand dome in 24-23s-22e, is at total depth of 11,233 feet in salt after successfully pulling stuck drill pipe. Salt was topped at 8691 feet and geophones were run after pulling stuck drill pipe. This test is 2100 feet north-northwest of the No. 1 dry hole, which drilled through the salt overhang and was abandoned after finding minor shows below.

☆ North Louisiana

Test Near Spider Production Tries for Rodessa Completion

Test 1 mile from Spider production prepares to complete in Rodessa; extension to Delhi and Big Creek fields completing; Ada test, showing first oil production for field, drilling deeper.

DeSoto Parish: Jarvis, Marcell and Schoonmaker's N. B. James 1, 4-11n-14w, 1 mile south of the Spider field, is testing for completion in the Rodessa zone. The well is bottomed at 6840 feet in Travis Peak, which was also tested. The Pettit was tested from 6448-65 feet and reportedly had a heavy gas showing. The well is likely to extend the field.

Richland Parish: Stanolind Oil & Gas Company is swabbing from the Tuscaloosa at 2762-69 feet in Delta Lumber Company 5, 10-16n-7e, prospective 1 mile west extension to the Big Creek field. Operators recovered 55½ barrels of oil and 30 barrels of salt water during the 9-hour test. Perforations were squeezed and another test is under way at 2763-65 feet.

Madison Parish: C. H. Murphy, Jr., and Sun Oil Company have extended Delhi field ½ mile east with completion of 2 wells, Haney McAllister 1, SE SW 17-17n-10e, and J. H. O'Neal 1, 17-17n-10e. Both were completed for good production in the Paluxy.

Webster Parish: Hope Producing Company is drilling below 5500 feet in Marion A. Davis 1, NEc 3-17n-8w, first test to indicate oil production in the Ada gas-condensate field. The oil pay was encountered about 100 feet above the anticipated gas pay for the field, and is believed to be in the Rodessa. The company had applied for unitization of acreage in the Ada field, the drilling unit to be composed of SE 34, SW 35, T-18n-8w; NW 2, NE 3 T-17n-8w.

☆ Arkansas

Pumper Completed in Edge Of Inactive Urbana Field

Pumper completed in north edge of inactive Urbana field, Union County; Ouachita wildcat still testing.

Union County: Creslenn Oil Company's Gus Norman 4, in SW SE NE 3-18-13w, north edge of the Urbana field, was completed at 3180-85 feet, pumping 25 barrels of oil daily. The completion attracted more than ordinary attention because the Urbana field had been almost dormant for several years.

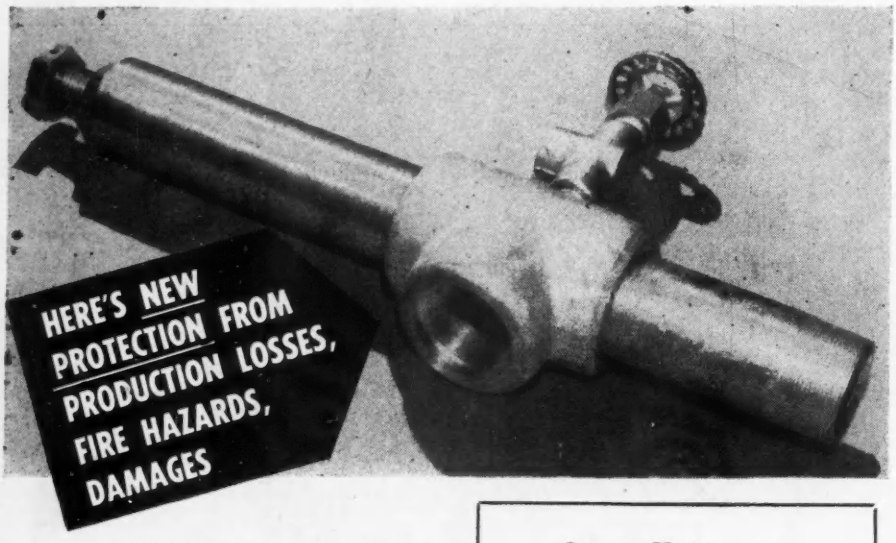
Ouachita County: Joe Mucher, Trustee's Josie Smith 1, C NE SE SW 30-15s-17w, still testing, pumped 38 barrels of 28-gravity oil and 8 barrels of salt water during 24 hours. The discovery will likely open the Pace City field, between Gum Creek and the old Smackover fields. The well is testing at 2758-62 feet, in the Glen Rose horizon. Another squeeze job may be run before official completion. Total depth is 3563 feet. The test is considerably higher on structure than abandoned producers in the McDonald area, and the Lion Oil Company's Annie 1, 2 miles northeast.

☆ Mississippi

Lincoln County Brookhaven Extension Try Is Successful

Brookhaven extension in Lincoln County successfully completed for good producer; Forrest County deep test nears ultimate drilling depth.

Lincoln County: Roeser & Pendleton's Cora Ballard 1, SW SW 17-7n-7e, has been successfully completed to extend the Brookhaven field 1⅛ miles southwest. The well is among the best producers brought in to date, having an initial flow of approximately 720 barrels of 39.4-gravity oil per day through ¼-inch tubing choke. Production was established by 354 perforations at 10,390-449 feet opposite the lower Tuscaloosa sand and saturated section amounts to about 60 feet, thickest in the field. Success of the Ballard puts a new impetus on ac-



The NEW OMSCO SAFETY VALVE*

Designed to give permanent protection from loss of production due to broken flow lines, safety heads, etc., the OMSCO SAFETY VALVE operates differently from any other type of safety valve. It is extremely compact . . . simple in design . . . reliable in operation. It has only one moving part . . . no parts to be fouled by sand and scale. It is installed on the surface, rather than in the well. Your own crew can install it in any position, just like any other line valve. Closing action . . . up to 4000 lbs. WP. . . . can be adjusted while flowing by a single external screw. No by-pass required. Sensitivity of the OMSCO SAFETY VALVE can be adjusted to suit individual well conditions.

The OMSCO SAFETY VALVE will dependably stop flow in lines if selected velocity is exceeded. Let us explain this new kind of protection from production losses. Write . . . right now. Price: 2" Model $145.00 F.O.B., Houston. Larger sizes available. Quotations on request.

*All patent rights reserved.

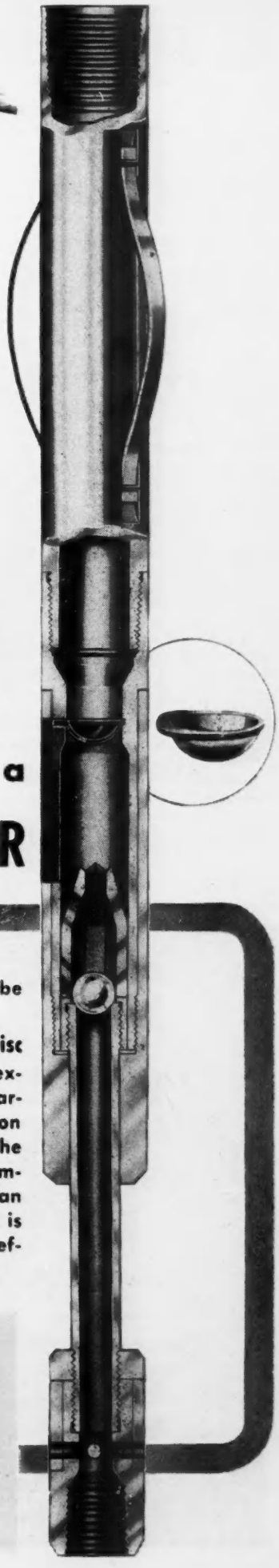
Install it on:

- **Xmas tree wings**
- **Separator lead lines**
- **Road crossings**
- **Fuel lines to drilling rigs**
- **Plant lines where line breakage is fire hazard.**

- **Tested to 8000 lbs.**
- **Dependable operation**
- **One moving part . . . nothing to foul by sand or scale**
- **Installed above surface**
- **Completely corrosive resisting**

OMSCO

OILFIELD MACHINE & SUPPLY CO.
Woodcrest 6-4458 P. O. Box 2172
HOUSTON, TEXAS



NO! NO! WILBUR we use a GRANT HYDROSTATIC BAILER

FOR ALL-AROUND BAILING EFFICIENCY —IT CANT BE BEAT!

The GRANT HYDROSTATIC BAILER develops a powerful, positive suction that easily picks up moveable materials in the well. Broken slips, bridge plugs, millings, etc. are sucked into the extra-large loading chamber for easy removal at the surface.

The hardest, toughest bridges are quickly broken up—Bridged over tubing may be cleaned without the necessity of pulling tubing and killing a flowing well—The powerful suction will also uncover large "fish" such as "twisted-off" drill pipe, tubing, gas anchors or other objects too large to be removed by the Bailer alone.

Exclusive Grant Composition Sealing Disc

The Composition Sealing Disc, an exclusive Grant feature, eliminates wearing parts in the Bailer. This construction allows nearly the entire length of the bailer to function as a loading chamber, giving it a greater capacity than any other on the market. The Disc is broken on each run and serves, in effect, as a new valve for each run.

GRANT OIL TOOL CO.

2042 East Vernon Avenue,

Los Angeles 11, California

BRANCHES—Avenal, Bakersfield, Santa Maria, Venture, California • Houston, Odessa, Texas.

tivity in the field, which now has 13 drilling operations.

Sun Oil Company's Leon Case 1, NEc 17-7n-7e, Brookhaven, is also preparing to complete after successfully eliminating salt water. Casing was perforated at 10,306-315 feet and after acidizing with mud acid, well was swabbed at the rate of 109 barrels of oil per day. Pump is being installed.

Humble Oil & Refining Company's M. C. Randall 1, SEc 17-6n-8e, first test in the Mallalieu field this year, is preparing to take drill-stem test of the Wilcox zone after running cores. Cores from 3900-52 feet recovered sand and shale with no shows indicated.

Forrest County: The Superior Oil Company's Cassie Bradford 1, SEc SW NW 1-3n-13w, is drilling below 14,645 feet after running electrical log. Driller has not reported on any shows encountered.

Adams County: The Ohio Oil Company's Geo. W. Armstrong 1, SEc 12-5n-3w, wildcat is drilling below 9892 feet with no shows. Cores from 9324-31 feet recovered hard gray shale. Potential productive zone for the test should be reached within the next few hundred feet. In the new LeGrange field Sohio-Roeser & Pendleton's Baker-Beach 1, NWc 34-6n-2w, is running core tests below 4645 feet in the Wilcox zone. Cores from 4606-39 feet recovered sandy shale with no shows. The well is a southwest offset of the field's discovery, which established production in the Massive sand zone below 9000 feet. In Cranfield field The California Company's Ella G. Lees 20, 29-7n-1w, has been successfully completed with an initial flow of 305 barrels of oil per day through 9/64-inch tubing choke.

Issaquena County: Burns & Millers Mohanna 1, NE NW 11-18n-3e, is preparing to run cores of the Eutaw below 5384 feet. No shows have been noted. C. H. Osmond's Anderson-Tully Lumber Company 1, NE SW 9-17n-3e, is also rigging up for a second test of the area.

☆California

Kettleman Hills South Dome Wildcat Is to Be Drilled

Wildcat to be drilled on Kettleman South Dome; Kern County wildcat below 15,000 feet; South Belridge deep test reportedly penetrates 2 sands; Newhall discovery disappoints; townlot discovery in East Los Angeles may result in 40 wells being drilled from 2-acre location.

Kern County: The South Dome of Kettleman Hills, which has been prospected only once in 10 years, is to be the location of a wildcat to be drilled by Tide Water Associated Oil Company, which will drill Fee 65-18 in 18-25s-20e. About a mile northwest, Los Nietos Producing and Refining Company last year drilled South Dome 41, which had oil and gas showings between 7465-97 feet. The well ran low on structure and was abandoned at 8550 feet last October. In 1935 Continental Oil Company drilled Gatchell 28-7 about a mile north in Sect. 7 to 7849 feet. On a formation test of the interval 5275-5702 feet, recovery was water and gas-cut mud.

Unlike the North and Middle Domes of Kettleman Hills, only the northwest end of the South Dome is exposed. The rest is covered by a layer of alluvium which makes uncertain the location of the buried portion of the dome. Trend of the exposed axis is toward Lost Hills so the structure at Lost Hills is assumed to be a continuation of South Dome.

In strictly wildcat territory 8 miles east of the north end of the Lost Hills field, Pacific Western Oil Company has reached 15,000 feet in National Royalties 1, 5-26s-22e. The hole is open below 9434 feet. Objective is the Vedder, productive at many points in the San Joaquin Valley.

Belridge Oil Company's deep test in the South Belridge field, second deepest wildcat in the Valley, is drilling below 13,800 feet. Reports current in the field that the operator has penetrated 2 sands, both too hard and tight to yield commercial production, are unsubstantiated.

Los Angeles County: Location for a third well has been staked in the new Gardena field, the recent joint discovery of British-American Oil Producing Company and The Texas Company. Latter operator is preparing to drill Gardena Community 9-1, a mile southeast of the discovery in 26-3s-14w. It will be a joint test with Seaboard. The discovery, Bodger 1 in 22-3s-14w, is currently producing 555 barrels of 26.7-gravity clean oil through 13/64-inch choke, with 1100 pounds pressure on tubing and 420 pounds on casing.

Shell Oil Company's Newhall discovery, Braille Institute 1 in 2-3n-16w, is currently producing only 12 barrels net of 27.4-gravity oil and an equal quantity of water, and abandonment is a possibility. Five miles south of Newhall, Seaboard has set 7-inch casing at 7477 feet in Mission Land 8-1.

Richfield Oil Corporation is drilling 2 wildcats in the East Los Angeles area. Flood Control 1 in 14-2s-12w is coring below 8000 feet. Boyle Community 33-1 in 31-1s-12, a townlot area, is drilling below 3520 feet. Location is on a 60-by-150-foot piece in a lumber yard. Operator will drill more tests by drilling diverted holes from this location. If a discovery is made it is possible that as many as 40 diverted holes will be drilled for the development of 300 to 400 acres, all from a surface area of approximately 2 acres.

☆ Illinois Basin

Jasper, Effingham Counties, Illinois, Get Discoveries

Jasper and Effingham counties get discoveries; new pool in prospect for Daviess County, Kentucky; Indiana deep test abandoned.

Jasper County: Secure Oil Company is opening a pool at Ireland 1, NWc 11-6n-10e, 1½ miles from production in the Willow Hill pool. A 1-hour drill-stem test of McClosky lime at 2665-70 feet made gas in 5 minutes and recovered 950 feet of oil.

Effingham County: Inland Oil Company's Fuennman 1, NW NW SE 3-8n-6e, 3 miles southwest of the new Lillyville pool, has set casing for production test at Rosiclare at 2405-30 feet. The well yielded 50 feet of oil and 60 feet of oil-cut mud in less than an hour during a drill-stem test.

M. L. Lewis' Questell 1, SW SE NW 11-7s-9e, is testing upper McClosky at 2981-87 feet, and flowing about 50 barrels of oil per hour after 2000 gallons of acid. Located 2½ miles south of Herald, the well is the heaviest producer in the area.

C. E. Brehm's Callicott 1, SE SE NW 10-6s-10e, a prospective pool opener, is testing Aux Vases at 2950-60 feet.

Kentucky

Fox and Fox's Grant 1, 15-P-28, a mile east of the Birk City pool, Daviess County, has set pipe to test Jackson sand at 1505-15 and 1565-1600 feet. Op-

Gotkool
WATER CANS
& COOLERS
GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non-leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today! . . . .
Gott
GOTKOOL
WATER COOLER
PURE WATER
GOTKOOL WATER COOLER
Made in 2, 3, 5, 8, 10, 15 and 20 gallon sizes with Push-Button Faucet.
GOTKOOL WATER CAN
Made in 1½, 2, 3, 5, 10, 15 and 20 gallon sizes. (Push-Button Faucet at slight additional cost.
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

ANNOUNCING

SPECIAL TRAIN SERVICE TO CHICAGO

FOR THE

A.P.I.

AMERICAN PETROLEUM INSTITUTE

CONVENTION

NOV. 10-15
1946

Katy Special train will leave Dallas at 5:00 p. m. (Highland Park at 5:15 p. m.) Saturday, November 9, 1946, immediately after the Texas A & M vs. S. M. U. football game. Special A. P. I. sleeping cars from South Texas points will join the train at Dallas.

For further information and reservations, contact
MAX P. CURTIS, D. P. A.
1303 Commerce St., Dallas,
or your local
KATY REPRESENTATIVE

M-K-T
KATY RAILROAD
MISSOURI-KANSAS-TEXAS

415

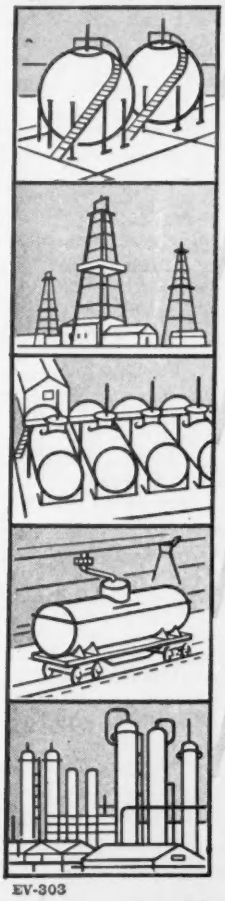
MISSOURI-KANSAS-TEXAS RAILROAD SYSTEM

FOR OIL FIELDS AND REFINERIES . . . IT'S

Screwed

Flanged

Everlasting VALVES



EV-303

In oil fields and refineries, Everlasting Valves are serving on: drilling boilers; blow-off lines; emergency throttle service on drilling engines; gasoline and oil loading racks; storage and measuring tanks; spray lines; . . . everywhere that *quick action*, full opening and drop-tight closing are vital.

Trouble-free — no sticking, no binding, no wedging or clogging — their operation is SURE and SAFE. WHY? . . . because their unique design eliminates the causes of usual valve failures.

For instance... the Everlasting Valve disc rotates parallel to — and constantly on — the seat, regrinds itself with each turn, keeps the seal EVERLASTING-ly tight. Each sealing part is free — self-compensating to expansion and contraction. The disc cannot work loose and choke the straight-through flow. Nor can dirt or scale lodge under the disc. Built for long, dependable, *hard* service in oil fields and refineries.

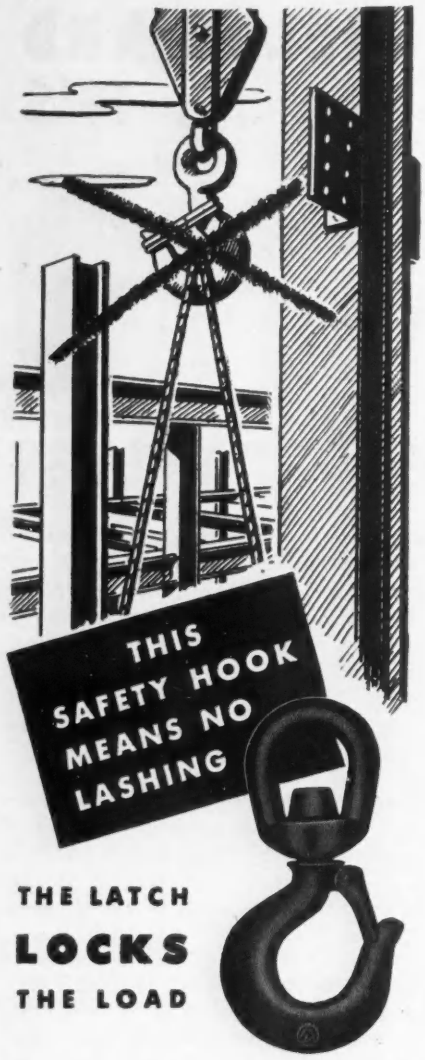
You should join the ranks of satisfied users of Everlasting Valves — write today for our Bulletin!

Blow-off valve for 350 lb. Oil Field Boilers.

EVERLASTING VALVE CO., 49 Fisk Street, Jersey City 5, N. J.

Everlasting Valves

FOR EVERLASTING PROTECTION



THE LATCH
LOCKS
THE LOAD

When Laughlin's newly-designed latch — providing about 80% of an ordinary hoist hook's throat opening — replaces rope lashing for securing the load in the hook, you not only speed up the job but also make safety *certain*. That's because the men who are *supposed* to lash loads, but *often don't* are relieved of the responsibility.

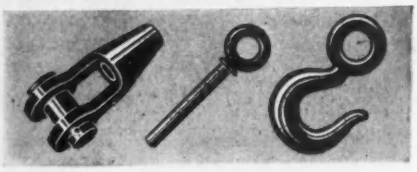
Get better acquainted with these sturdy, drop-forged, heat-treated, standard-type hooks . . . made safe by dependable latches and stainless steel springs . . . ½ to 15 ton safe load.

WRITE FOR CATALOG

All Laughlin hooks — safety, hoist, cargo, etc. — are heat-treated, drop-forged, weldless. Distributed through mill, mine and oil field supply houses.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



erators set casing to 1503 feet without running a drill-stem test.

Indiana

Continental Oil Company's deep test, Cooper 1, SWc 13-3s-14w, Griffin pool, Posey County, has been abandoned as dry at 6408 feet. Trenton lime was topped at 6177 feet. Production test was made of St. Louis lime at 3140-45 feet, but the yield was non-commercial.

☆ Michigan

Week's Starts Set 1946 High; Osceola Test Misses Pay

New starts totaled 30 for the week to set a 1946 high and equal the high points established the two preceding years. Shallow gas locations accounted for 11 of the new locations and seven others were wildcats.

Osceola County: The Pure Oil Company's Zimmerman A-1, N½ NW SE 12-17n-7w, 1 mile northwest of the Garfield deep gas-distillate discovery, missed a commercial pay zone in the Richfield and was shut down for orders at 5150 feet. It was 30 feet lower on the objective than the discovery.

Isabella County: Roosevelt Oil Company bottomed at 4805 feet on Gibson 1, W½ SW NW 12-14n-3w, Richfield test in the old Mt. Pleasant field, without logging an oil pay. Test will be plugged back and completed at 3550 feet in the Dundee, conventional oil formation in the field.

☆ Ohio

Muskingum County Has Oil Discovery at East Newton

East Newton has oil discovery; fourth well completed in Madison pool; Salt sand gas found at Chester Hill; Brush Creek extended south by small gas well; Clinton to be tested in Newton Township.

Muskingum County: John Morrow et al's Eugene Good 1, SE SW 25, Newton Township, wildcat midway between the Lancaster and Brush Creek fields, drilled Clinton sand from 3728-88 feet with a good showing of oil and gas. After a 100-quart shot the well swabbed 25 barrels the first day.

Columbiana County: C. A. Smith's B. Daley 1, SW NE 14, Madison Township, east offset to Eberly's Bennett 1, reached the Oriskany at 4427 feet and drilled to 4437 feet. An initial gauge of 4½ million cubic feet of gas blew down to 3 million when the well was shut in.

Morgan County: Bowman Brothers' David Coler 1, NW NE 2, Marion Township, extends the Salt sand gas production ½ mile north. Top of sand at 963 feet was drilled to 968 feet with a gauge of 700,000 feet. Ohio Fuel's Frank Kuntz 1, W½ SE 27, Deerfield Township, ½ mile south of Finley 1, made 200,000 natural from broken Clinton at 4275-4306 feet. After a 30-quart shot the well is to be tubed.

Licking County: Ohio Fuel's A. T. Lingafelter 1, Newton Township, was dry in the Cinnamon and will be drilled to the Clinton.

☆ Rocky Mountain Area

Big Horn Basin, Wyoming, Prospects Hold Interest

Big Horn Basin, Wyoming, deep tests again hold interest; Park County prospect tests oil in Madison; Rangely field, Colorado, Shinarump sand extension tries fail; Routt County abandonment is disappointment for Weber sand prospects east of Rangely.

Wyoming

Deep tests of the Big Horn Basin again hold the interest of Rocky Mountain oil operators as G. & G. Drilling Company's (The California Company et al) Neiber Dome wildcat at Unit 1, SE NE NW 19-45n-92w, Washakie County, begins to test saturation in the Embar formation below 10,025 feet. Operator is now running temperature survey to 10,333 feet, total depth, in the Tensleep. No shows have been reported in the Tensleep formation. This well is 20 miles south of The Pure Oil Company's River Dome field, which now has 3 wells producing from the Embar formation below 10,000 feet. Recently Pure acidized 2 of the wells and increased production in the discovery well at Unit 1, NE NE NW 18-48n-92w, from 25 to 160 barrels per day flowing with 250,000 cubic feet of gas. Pure's Unit 2, a mile northwest of the discovery, is flowing 70 barrels of oil per day after acidizing with 7000 gallons, and the Unit 3, a mile east of the discovery, has recently run casing on top of Embar at 10,003 feet, with total depth 10,151 feet, and is now testing the well naturally. Midway between the River Dome field and the Neiber Dome test, General Petroleum Corporation is drilling South Fork wildcat, No. 88-24-G, SE SE SE 24-46n-92w. This test, bottomed at 8360 feet, is running protection string. Muddy formation in this well was topped at 8173 feet, and the well made water in the Frontier section. This well will also be drilled to the Embar formation at around 10,000 feet.

Park County: Stanolind Oil & Gas Company's Madison test at Elk Basin is drilling below 4650 feet, 300 feet in the Madison. The well is Madison 38, NE SE NE 24-58n-100w, and several drill-stem tests have been taken in the Madison formation. On test between 4569-4610, with tester open 1½ hours, the recovery was 2400 feet of 29-gravity oil.

Colorado

There have been 2 extension failures in the Shinarump sand, Rangely field, Rio Blanco County. Production was found in this formation in July by Continental Oil Company's Rooth 2, C SW SW 15-2n-103w, which produced at the rate of 847 barrels of 39-gravity oil through choke per day and was rated the best well in the field. Stanolind's M. B. Larson "A-1," an east offset to Rooth 2, cored the Shinarump section and found only a small show of oil and on drill-stem test between 5726-5809 with tester open 2 hours recovered only 60 feet of drilling mud with no oil or water. The well is being deepened to the Weber. Idaho - Sharples - Wasatch northwest diagonal offset to Rooth 2 at Larson 1-16, C NE SE 16-2n-103w, cored the same section and recovered

3 feet of saturated sand between 6081-84 feet and is now making drill-stem test, but this well is also expected to be immediately deepened into the Weber. Continental is now drilling a south offset to its Shinarump producer at Rooth 4, C NW NW 22-2n-103w, and if this well fails to find Shinarump production there is little possibility the zone will be productive in other wells in the Rangely field.

Routt County: Abandonment of Union Oil Company of California's Crawford 1, NE NE SW 32-4n-89w, Beaver Creek structure, was a further disappointment for Weber sand prospects east of the Rangely field. The well was drilled to 5801 feet, through the Weber, topped at 5249 feet, and into the Morgan formation.

☆ Canada

Husky's Wildcat Is Indicated Gas and Crude Discovery

A commercial discovery of natural gas and an indicated commercial discovery of crude are reported for the initial Western Canadian wildcat of Husky Refining Company, Cody, Wyo. The twin discovery is Husky-Oil & Gas Development Company 4, NE lsd 4 14-47-27w3, Lone Rock area of Central Western Saskatchewan. Site is 12 miles south and east of the current producing limits of the Alberta-Saskatchewan Border field of Lloydminster, and 6½ miles east of the Alberta border.

The well entered the "Sparky sand"—source of Lloydminster's Lower Cretaceous oil—at 1813 feet, with gas evident in cores to 1819 feet, where a shale break was encountered, continuing to 1824 feet, where an oil-saturated sand was topped. Coring halted at 1833 feet, still in this oil sand.

With packer set above the gas sand, a 1 hour drill-stem test yielded about 4000 Mcf of gas plus a small amount of oil and mud. Packer was then set in the shale break above the oil sand, and the well immediately commenced making a fair gas flow. Test was halted after 15 minutes. The pipe yielded a 300-foot column of estimated 15-gravity crude plus some mud. After allowance for gassified condition of the column, net oil influx rate was estimated at about 5 barrels hourly. Seven-inch casing has been set at 1825 feet, and test of the oil sand will get under way immediately.

Shell Oil Company of Canada's key west flank test on the Jumping Pound anticline shows plenty of "wet gas" plus some salt water (the latter presumed to be from base of the porous Madison limestone) but appears to have ended hopes for an oil field of the Turner Valley type in the Alberta foothills west of Calgary. The well has completed drilling at 10,579 feet after topping the Madison at 10,329 feet, setting 7-inch casing at the contact, and penetrating around 115 feet of varying porosity. Three-eighths mile southwest of, and 684 feet lower in elevation than the Shell 4-24-J, wet gas discovery, the current 16-14-J had been a bright hope for commercial oil production. It is now being cleared, with outlook at best a wet gas well, provided the small volume of salt water so far showing in lower portion of the lime can be shut off.

Dependable LE ROI Engines come through with ample reserve power

Le Roi engines utilize natural gas, butane, or gasoline — you can put them to work anywhere. They are conservatively rated in sizes ranging from 4 to 400 h.p. to assure you of a hidden power reserve. Le Roi engineers left it there purposely to help you out of tight spots. That's why more and more drillers everywhere are using Le Roi power. Write for bulletins.

Le Roi Company
Milwaukee 14, Wisconsin

NEW YORK • WASHINGTON • BIRMINGHAM • TULSA • SAN FRANCISCO

SEE YOUR NEAREST LE ROI DISTRIBUTOR P-67

Oklahoma
Le Roi Company Branch—Tulsa
Carson Machine & Supply Co. Oklahoma City, Oklahoma

East and South Texas Gulf Coast
Southern Engine & Pump Co. —Houston, Kilgore, Edinburg, Dallas, San Antonio, Texas and Lafayette, Louisiana

Western Pennsylvania — Western New York
Lloyd, Smith Company — Bradford, Pennsylvania

Kansas
Carson Machine & Supply Co. — Great Bend

Illinois — Western Kentucky
Western Machine Company — Centralia, St. Louis

Michigan
Hafer Engine Service — Reed City

Northern Louisiana and Mississippi
Ingersoll Corporation—Shreveport, Louisiana, Jackson, Mississippi

Rocky Mountain Area
Industrial Power Units Inc. — Casper, Wyoming

West Coast
Le Roi — Rix Machinery Co. — Los Angeles, California

North and West Texas, New Mexico
General Machine & Supply Co. —Wichita Falls, Odessa, Lubbock, Texas

Canada
Drilling Supplies Ltd. — Calgary, Alberta

EXPLORATORY COMPLETIONS

ALABAMA WILDCAT

Marengo County—Failure: Ballio & Trotter's Cam llo B. Tutt, nw ne 32-14n-1e, abnd 9-14-46 at 4540.

CALIFORNIA WILDCATS

Kern County—Failures: Amerada's Barnett 38-10, 10-29s-29e, Ant Hill area, Olcese 1720, Pyramid Hills 3782, Schist 4245, abnd 9-22-46 at 4280.

National Investors Fund's Orchard 1, 5-25s-18e, McClure Valley area, Point of Rocks 1447, abnd 9-21-46 at 2036.

Oceanic Oil Co.'s KCL 1, 22-10n-20w, Grapevine area, abnd 9-23-46 at 2816.

Ventura County—Failure: Bennett Exploration Co.'s Triunfo 2, 24-1n-19w, Triunfo area, abnd 9-25-46 at 3195.

COLORADO WILDCAT

Routt County—Failure: Union of California's Crawford 1, ne ne sw 32-4n-89w, Beaver Creek structure, Dakota 3289, Lakota 3381, Curtis 3869, Shinarump 4479, Weber 5249, Morgan 5370, abnd 9-25-46 at 5801.

FLORIDA WILDCAT

Dade County—Failure: Gulf's State Model Land Co. 1, Unsurveyed-60s-35e, abnd 9-22-46 at 6024.

ILLINOIS WILDCATS

Christian County—Failure: Oscar A. Reed's Bennett 1, se se se 27-15n-1w, abnd 950.

Clay County—Failure: A. J. Slagter, Jr.'s Gray 1, se ne ne 29-3n-6e, abnd 3168.

Clinton County—Failures: W. H. Krohn's Brinkman 1, se se nw 25-1n-3w, abnd 1301.

Joe Kesl, Jr.'s Maibaum 3, nw ne se 12-3n-3w, abnd 1160.

Coles County — Failures: Earnest Zink's Goff 1, nw sw nw 18-11n-10e, abnd 1946.

Earnest Zink's Woodward 1, nw sw sw 18-11n-10e, abnd 1920.

Nation Oil Co.'s McMechan 1, ne se se 31-11n-10e, abnd 1960.

Cumberland County—Failures: Nat'l Assoc. Pet.'s Handley 1, sw se se 26-10n-7e, abnd 3815.

Nation Oil Co.'s Decker 1, se se se 6-10n-10e, abnd 2053.

Nation Oil Co.'s Strong 1, nw nw sw 9-10n-10e, abnd 1833.

Edgar County—Gas Discovery: Frank Scales' Tate 1, se se 33-13n-13w, flow 150,000 gas, Penn sand 444-54, td 454.

Edgar County — Failure: Frank Scales' Knight 1, sw sw sw 26-14n-14w, abnd 160.

Effingham County—Failures: Nat'l Assoc. Pet.'s Salesman 1, sw sw sw 16-5n-4e, abnd 2545.

Nat'l Assoc. Pet.'s Liberty School 1, se se nw 21-9n-4e, abnd 2012.

Gallatin County—Discovery: Wiser Oil Co.'s Mitsdarffer 1, ne se nw 24-8s-8e, pump 21 bbls, McCloskey lime 2846-50, td 2938.

Gallatin County—Failure: Texas Co.'s McGehee 1, sw sw ne 29-9s-9e, abnd 2515.

Lawrence County—Failure: C. E. Skiles' Litherland 1, se sw ne 13-2n-12w, abnd 2038.

Moultrie County—Failure: Ben J. Taylor's King 1, se ne se 5-12n-6e, abnd 2028.

Shelby County—Failures: Nat'l Assoc. Pet.'s Keck 1, se sw nw 27-10n-6e, abnd 2354.

Paxton Oil Syndicate's Lovins Hrs. 1, ne ne ne 36-12n-5e, abnd 2110.

St. Clair County—Failure: Vic & Van Operating Co.'s Birk 1, ne ne sw 36-2n-10e, abnd 3299.

Wabash County — Failure: C. E. Skiles' Woods 1, se nw se 25-1n-14w, abnd 2980.

Wayne County—Failure: George Daly's Rutger 1, se sw nw 9-1n-7e, abnd 3250.

White County — Failure: B. M. Heath's Hamilton 1-A, sw sw se 13-7s-8e, abnd 2245.

INDIANA WILDCATS

Laporte County — Failure: Walter Blow's Martin 1, sw sw se 8-38n-3w, abnd 1401.

Perry County—Failure: Pollack's Fuqua 1, nw ne 12-7s-3w, abnd 761.

Pike County — Failure: A. W. Warner's Schmidt 1, ne ne se 18-1n-8w, abnd 1475.

Posey County—Failure: Milton Lobree et al's Jackson 1, nw nw nw 27-5s-13w, abnd 3015.

KANSAS WILDCATS

Butler County—Failure: D. Alter's Swindel 1, ne ne nw 22-28s-3e, abnd 3178.

Ellsworth County—Failure: Royer & Farris' Razell 1, sw se ne 21-16s-8w, abnd 3450.

Pratt County—Failure: Stanolind's Humble 1, sw sw sw 4-29s-12w, abnd 4695.

Sumner County—Failure: Fred U. T. Smith's Mason 1, c ne sw 11-34s-2w, abnd 4695.

KENTUCKY WILDCATS

Muhlenberg County—Failure: J. P. Moore's Carver 1, 15-H-30, abnd 1268.

Union County—Failure: W. Chenault's Alloway 1, 23-M-19, abnd 1400.

NORTH LOUISIANA WILDCATS

De Soto Parish—Failure: R. F. Kayser, Tr.'s Dickson 1, 2349 fr el 30 fr nl 23-14n-13w, abnd 9-16-46 at 2833.

Madison Parish—Failure: James M. Snowden's C. T. MacNeille 1, c nw se nw 25-17n-13e, Wilcox 2400, abnd 9-21-46 at 4977.

Richland Parish—Failure: Lion Chemical Co.'s Tensas 1, 1980 fr sl 660 fr wl 22-14n-5e, Chalk 3525, abnd 9-18-46 at 4524.

Richland Parish — Gas Discovery: F. L. Bryant Co.'s Thompson 1, sw ne 4-16n-7e, ¾ mi ne Dehlco, Tuscaloosa gas pay 2525-44, Paluxy sw sd 2658-80, perf 84 shots 2528-42, flow 4 mln gas open, rock pressure 1138 lbs, comp 9-17-46 at 2692.

SOUTH LOUISIANA WILDCATS

Calcasieu Parish—Choupique Oil Discovery: Union Sulphur Co.'s Eugene Ellender et al 1, 1631.4 w 313.1 n of sec 17-11s-10w, on s flk Choupique Prospect, 5 mi n W. Hackberry prod, pay 8825-31, perf 24 shots 8825-31, flow 93.3 bbls 40.7-gr, 14/64-in, tp 3100 lbs, cp 300 lbs, gor 12,781/1, comp 9-19-46 at 10,037.

Jeff Davis Parish—Failure: Stanolind's W. E. Walker 1, fr sec sw¼ sect 29 go n 330 w 330 to lcn in 29-9s-5w, 1½ mi w of sly prod at Welsh Dome, abnd 9-21-46 at 9701.

Terrebonne Parish—Failure: Superior's La. Ld. & Expl. Co. 1, 849 s 2555 e of nwc 24-21s-16e, se side Isle Dome Prospect, abnd 9-24-46 at 6011.

St. Mary Parish — Failures: Amerada's Lagerman-Lacy 1, start swc sect 47 go 75° 30 min w 583 th n 74° 30 min e 660 to lcn in 47-14s-9e, 3 mi s Charenton fld, abnd 9-23-46 at 7558.

Atlantic's Grand Lke. State 1, 3200 e 2200 n of swc Grand Lke. 19-13s-10e, 2 mi n Charenton prod, abnd 9-23-46 at 12,102.

SOUTH LOUISIANA NEW PAY TEST

St. Landry Parish—N. Cankton Gas Discovery: Humble's Vincent Boagni 1, fr nec sect 48 go wly alg no 15.1 th sly at ra 2165.6 to lcn in 48-8s-4e, pay 3064, perf 10 shots 3064-65, flow 675,000 dry gas, 3/16-in, tp 1250 lbs, comp 9-16-46 at 11,271.

MICHIGAN WILDCATS

Gratiot County—Failure: McClure Drilling Co.'s Gager 1, sw sw sw 4-9n-4w, Dundee 3143 ft, abnd 9-27-46, 3209 ft.

Mecosta County—Failure: Austin Oil Co.'s State 1, nw nw sw 16-14n-9w, abnd 9-22-46, 3851 ft.

Montcalm County—Failure: Montcalm Development Co.'s Pollard 1, nw nw ne 8-11n-5w, Dundee 3393 ft, abnd 9-24-46, 3415 ft.

Ottawa County—N. Zeeland Gas Discovery: Clawson Development Co.'s Blauwkamp 1, c se se 2-5n-14w, Berea sand 965 ft, gauged 800,000 ft gas 9-19-46, td 977 ft.

MISSISSIPPI WILDCAT

Yazoo County—Failure: Sohio's J. Christopher-Texas Co. 1, 5-11n-2w, Wilcox 1718, Chalk 5188, Eutaw 6010, Tuscaloosa 6750, abnd 9-22-46 at 7600.

MISSISSIPPI OUTPOST

Lincoln County — Brookhaven Extension: Roeser & Pendleton's Cora M. Ballard 1, sw sw 17-7n-7e, flow 720 bbls 39.4-gr, ¼-in, 354 shots at 10,390-449 in L. Tuscaloosa, comp 9-22-46 at 10,470.

MONTANA OUTPOST

Toole County—Kevin-Sunburst Oil Extension: Big West Oil's Proefrock 1, c nw nw 7-34n-4w, Cut Bank 2265, L. Cut Bank 2318, pump 15 bbls, comp 9-4-46 at 2364.

OHIO WILDCATS

Carroll County — Failure: Frank Lyons' Clyde Allen 1, se se 8, East Township, no Oriskany, abnd 9-24-46 at 4310.

Muskingum County — Oil Discovery: John Morrow et al's Eugene Good 1, se sw 25, Newton Township, Clinton 3728-3788, flow 25 bbls, comp 9-27-46 at 3798.

OKLAHOMA WILDCATS

Cotton County — Failure: J. E. Jackson's Bone 1, nw sw sw 8-4s-10w, abnd 1455.

Creek County — Failure: W. J. Sherry's Lashley-Johnson 1, se sw ne 20-16n-8e, abnd 3880.

Greer County—Failure: Tom Greer's McLoud 1, sw ne nw 32-6n-21w, abnd 696.

Jefferson County—Failure: W. E. Miller's Washington 1, nw ne nw 21-6s-7w, abnd 2607.

Lincoln County—Failure: L. B. Jackson et al's Biles Est. 1, sw sw sw 25-16n-4e, abnd 4187.

Logan County — Failure: Harper-Turner's Watts 1, 4-17n-2w, abnd 6018.

Pottawatomie County—Failure: E. N. Jordan's Graham 1, se se se 22-6n-4e, abnd 3818.

Seminole County—Failure: Big Chief Drlg. Co.'s Stockton 1, se sw ne 1-6n-5e, abnd 4479.

Stephens County—Failure: V. V. Grant et al's Binder 1, ne se ne 25-2s-9w, abnd 2536.

Woodward County — Failure: Continental's Howard 1, sw sw se 15-27n-21w, abnd 7692.

Cimarron County—Failure: Sinclair Prairie's State Tract 44-1, c nw nw 28-6n-5e, abnd 9-26-46 at 5582.

Cotton County—Failures: Johnson Brothers' Gandy 1, se se nw 29-3s-9w, abnd 9-19-46 at 1830.

S. D. Johnson's Cooper 1, nw ne ne 9-3s-11w, abnd 9-27-46 at 2210.

C. B. Richardson's Dodge 1, sw sw ne 4-4s-10w, abnd 9-26-46 at 1517.

E. W. Whitaker's Simmons 1, nw sw 9-4s-11w, abnd 9-28-46 at 1665.

Garvin County—Failures: Anderson-Prichard Oil Co.'s Grant 1, se sw nw 30-1n-1e, abnd 9-25-46 at 2030.

Anderson-Prichard Oil Co.'s Shumate 1, sw se sw 10-3n-2e, abnd 9-22-46 at 3012.

Logan County—Failure: Frank Russell's Griffin 1, se se nw 33-15n-1w, abnd 9-27-46 at 6125.

McCurtain County—Failure: C. W. Whitehead's Hortline 1, ne sw se 2-7s-21e, abnd 9-28-46 at 4347.

Okmulgee County—Failure: Liberty Glass Co.'s Sitler 1, nw se sw 3-15n-12e, abnd 9-26-46 at 2610.

Osage County—Oil Discovery: A. G. Oliphant's Osage 1, sw ne ne 21-5n-4e, pump 20 bbls fr Cleveland sd 2852-81, comp 9-27-46 at 3571.

Pottawatomie County—Failure: Charles F. Balph's Jones 11, ne ne sw 12-11n-6e, abnd 9-27-46 at 3100.

Seminole County—Failure: Globe Oil Co.'s Castor Estate 1, se ne ne 21-9n-7e, abnd 9-28-46 at 4408.

WEST TEXAS WILDCATS

Coke County—Failure: Warren Pet. Corp.-Humble's Hamilton 1, c ne ne H&TC Ry. 275, blk 1-A, elev 2092, Ellenburger 6367, abnd 6675.

Dawson County—Failure: Ray A. Albaugh et al's Orson 1, c se sw T&P Ry. 15, blk 33, T-5-N, elev 2668, anhy 1380, San Andres 3390, abnd 4010.

Glasscock County—Failure: C. T. McLaughlin et al's Neal-Shell 1-A, 1980 snl 574 wel T&P Ry. 48, blk 33, T-3-S, elev 2745, abnd 3501.

Hockley County—Failure: H. L. Brown & Ridley Wheeler's Hamill 1, 660 out swc labor 25, Lge 719, State Capitol Lands, elev 3601, brown lime 3470, San Andres 3760, abnd 4802.

Loving County—Failure: Argo Oil Corp.'s T. P. Land Trust 1-C, c sw se T&P Ry. 7, blk 55, tsp 1, elev 3071, anhy 1370, salt 3190-3317, Delaware lime 3852, sand 3868, abnd 4274.

Lubbock County — Failure: Bankline Oil

WHITE TRANSITS · LEVELS · ALIDADES

With Coated Optics

Precision-built for exact work — WHITE TRANSITS have been used on major construction jobs the world over for more than 40 years. (Illustrated is famous Type II Transit).

The "Willis Pendulum Astrobe"

White-designed especially for the Army — identifies locations • Establishes control points for aerial and general surveys, and deflections of the vertical in geodetic surveying • Accuracy within 25 ft.

Send for Bulletin 1039 on Type II Transit — designed for U. S. Engineer Corp, also circular describing "Coated Optics".

DAVID WHITE COMPANY

313 WEST COURT STREET • MILWAUKEE 12, WISCONSIN

Co.'s Adkisson-Stanolind 1, c sw se E. L. & RR. 37, blk C-2, elev 3333, anhy 1530, Yates 1980, brown lime 2850, San Andres 3070, Glorietta 4490, Clear Fork 5120, Tubb 5760, abnd 6197.

WEST TEXAS NEW PAY TESTS

Andrews County—Fullerton-Devonian "8500" Fld Glorietta Discovery: Mid-Continent Pet. Corp.'s University 8-11, c se ne sect 29, blk 13, offset Devonian prod, elev 3290, Devonian 8535, pump 119 bbls 36-gr oil, gor 200/1, 2500 gals acid Glorietta perf 6070-6120, td 8619, pb 6131.

Menard County — Morrow Deep Failure: Warren Pet. Corp.-Tevis F. Morrow's Russell 2, 620 snl 1980 wel sect 18, S. Wallick sur, offset 2200-ft Canyon disc, elev 2112, Pennsylvanian 920, Canyon 2232, Strawn 3120, Ellenburger 4162, Hickory sand 4505, abnd 4579.

WEST CENTRAL TEXAS WILDCATS

Jones County—Oil Discoveries: Harry W. Elliott et al's Otto Roberts 1, 2492 snl 2168 wel of John Gasner sur 8 and on e bank of stream, 1½ mi sw of prod, elev 1542, pump 16 bbls 36-gr oil, 66% wtr, sand 1640-51, comp 9-16-46 at 1652.

M. E. Hart et al's Morrison Est 1, 330 fr swc 200-ac lse, 5645 snl 4912 ewl David T. Bruce sur 135, 1¼ mi sw Akard fld, elev 1696, base anhy 1090, pump 91 bbls 41-gr oil, 5% wtr, fr Flippen 2172-83, shot 30 qts nitro 2188-96, comp 9-15-46 at 2196.

Jones County—Failures: Dave Bennett-J. W. Sorrell's Eoff 1, 330 out nec sbdn 2, Austin & Williams sur 338, elev 1740, base Dothan 2632, Noddle Creek 2662, Saddle Creek 2805, coal 2866, Flippen 2876, abnd 9-23-46 at 3330.

F. J. Hart et al's Myatt 1, 2800 nsl 150 ewl T&P Ry. 1, blk 15, elev 1598, abnd 8-30-46 at 2003.

Shackelford County—Failure: R. H. Roark-Hooker-Roberts & Jones & Stasney's Lynch 1, 730 snl 670 ewl sect 9, Blind Asylum Lands, abnd 9-20-46 at 4505.

Stephens County — Failure: Palmer Oil Corp's Caudill 1, 2417 snl 2457 wel of 352-ac tr, R. S. Owings sur, elev 1241, Marble Falls 4045, Ellenburger 4850, abnd 9-15-46 at 5150.

NORTH TEXAS WILDCATS

Cooke County—Failures: Russell Maguire et al's Campbell 1, 1320 nsl 1325 ewl of lse, M. Alexander sur, Ellenburger 1989, abnd 9-22-46 at 2001.

Frederick Electric Co.'s Holland 1, 2007 snl 150 ewl A. Houston sur, abnd 9-15-46 at 1233.

Montague County—Failure: Phillips' Howard-Alco Valve Co. 1-A, 1080 fr swl 700 fr nwl Guadalupe College sur, Bend 5924, Barnett 6265, Viola 6385, abnd 9-26-46 at 6430.

Wichita County—Failure: W. M. Meredith et al's Klinkerman 1, 435 snl 1040 wel blk 263, Waggoner Colony Lands, abnd 9-18-46 at 1936.

Young County—Oil Discovery: John T. Cox et al's R. W. Davis 1, 330 out sec S.P. Ry 1, 3¾ mi nw Eliasville, elev 1322, Palo Pinto 1594, Bend 3546, flow 70 bbls oil, 2,500,000 gas, 2-in nat fr Bend 3558-61, comp 9-16-46 at 3576.

Young County—Failure: Champlin Ref. Co.'s Bartholomees 1, nw nw se BBB&C sur 1, elev 1177, Bend 4265, Ellenburger 5343, abnd 9-19-46 at 5435.

EAST TEXAS WILDCATS

Bowie County—Failure: Delta Dr. Co. et al's Gauntt 1-a, 1320 snl 1720 ewl of James Giles sur, elev 324, Nacatoch 1105, Saratoga 1642, base Annona 2185, Austin chalk 2720-2777, Woodbine 3120, Georgetown 3319, Goodland 3873, Paluxy 3940, abnd 4180.

Van Zandt County — Failure: Delta Dr. Co. et al's Houston-Magnolia 1, 3350 wel 2150 nsl A. L. Martin sur, elev 477, Nacatoch 2005, Pecan Chalk 2806, Austin Chalk 3767-4143, Woodbine 4573, Georgetown 5431, Paluxy 6653, Glen Rose 6955, Massive Anhydrite 8084-8288, Pettit 8907, Travis Peak 9027, abnd 9-19-46 at 9210.

Wood County—Failure: Delta Dr. Co.-W. J. Weaver et al's McKenzie-Sun 1, 995 nsl 1550 ewl Joel P. Wood sur, elev 467, Nacatoch 1695, Pecan Chalk 2597-2772, Austin 4120-4243, Sub - Clarksville 4275-4310, Woodbine 4737, Georgetown 5550, Ft. Worth 6170, Duck Creek 6475, abnd in Duck Creek 6520.

SOUTH CENTRAL TEXAS WILDCAT

Dimmitt County—Failure: Humble's J. C. Johnson 1-B, 660 fr nw&nel 177-ac lse in 584-ac "B" lse, J. Delgado sur 598, 1½ mi w Johnson 1 failure, abnd 9-24-46 at 3193.

SOUTH CENTRAL TEXAS OUTPOST

Zavala County—Leona River Failure: Texas Co.'s Geo. W. West 4, 1980 fr nel 660 fr nwl sect 5, TCRR sur, blk 4 on 4675.8-ac lse, 2950 se West 3, 4087 e of West 1, abnd 9-21-46 at 4444.

SOUTHWEST TEXAS OUTPOST

Jim Hogg County—Failure: Humble's A.-M. K. Bass 24, 660 n th 1980 w fr swc Mary Merick tr, 660 fr sl 330 fr wl GC&SF sur 719 on 29.618-ac lse, 2/3 mi nw Kelsey fld, abnd 9-11-46 at 7715.

LOWER TEXAS COAST WILDCATS

Jackson County — Failure: Crown Central Pet. Corp.'s L. H. Simon 1, 5035 fr wl 375 fr nl 1250 fr el 361.96-ac lse, 2450 s 13,300 e fr nwc Francis Keller sur, 6250 sw Moody Rch prod, abnd 9-20-46 at 9050.

Karnes County—Failure: W. E. Kinnear's A. D. Willbern et ux 1, 150 swl 2914 fr sel Brooks & Burleson sur 3, 330 fr swl 2914 fr sel 330 fr sely/nwl 256-ac lse, 3 mi ne Runge fld, Luling 6800, Massive Wilcox 6972, abnd 9-18-46 at 7102.

LOWER TEXAS COAST OUTPOST

Brooks County—Scott & Hopper Failure: Humble's Scott & Hopper 14, 1980 fr sl 1980 fr wl G. Calderon sur 680, 3540 e of Well 1 on 28,958-ac lse, abnd 9-18-46 at 7371.

LOWER TEXAS COAST NEW PAY TEST

San Patricio County—Midway Oil Discovery: F. M. Boykin, Jr. et al's H. H. Hutto 1, 467 fr wl 330 fr nl 40-ac lse, nw nw sect 81, G. H. Paul sbdn Coleman-Fulton Pstr. Co. lands, Hutto sand pay 5107, perf 8 shots 5128½-39½, flow 170.01 bbls, 5/32-in, gor 400/1, tp 650 lbs, cp 900 lbs, comp 9-20-46 at 5143.

UPPER TEXAS COAST WILDCATS

Matagorda County—Failure: Salt Dome Oil Corp.'s State of Tex. 1-157, 660 fr el 1980 fr nl sect 157, Matagorda Bay, 640-ac lse, abnd 8-22-46 at 5812.

Montgomery County—Failures: Humble's E. L. Bender 3, 467 s of sl Degnan 50-ac lse, 1689 e of m/sly/wl 5000-ac lse, Montgomery CSL sur 2, abnd 9-25-46 at 6562.

McKay Donkin-Lloyd H. Smith's J. G. Browder 1, 330 fr nl 660 fr el 65-ac lse, 1350 fr wl 2500 fr sl de la Garza sur, 10 mi n Conroe fld, abnd 9-20-46 at 10,001.

UPPER TEXAS COAST OUTPOSTS

Brazoria County—Pledger Gas Extension: Humble's Pledger Gas Unit 2-1, 660 fr nel lot 45 660 fr sel lot 46, in Lot 46 on Travis Lambert property, D. Shipman and I. N. Charles sur, 7900 w of Humble's Carter 1, n gas exten, pay 6830, perf 70 shots 6830-42, flow dry gas, no gge, tp 1350 lbs, comp 8-30-46 at 6893.

Liberty County—Hull SE Flw Oil Extension: General Crude's Phoenix Dev. Co. 1, start sly cor 284-ac lse go 2590 nly alg wl th 1347 e at ra to lcn 1125 se Gulf's Phoenix 9669-ft failure, Jesse Devore Lge, pay 7850, perf 47 shots 7850-58, flow 50 bbls 32.5-gr, 10/64-in, gor 300/1, tp 550 lbs, comp 7-27-46 at 9016.

UPPER TEXAS COAST NEW PAY TESTS

Chambers County—Double Bayou Distillate Discovery: Humble's Double Bayou Unit 2-A, 660 fr sl 331 fr wl R.O.W. McManus sur, 160-ac lse, perf 36 shots 9000-07, flow 7.2 bbls 50.1-gr dist, 240,000 gas, 1/8-in, tp 2070 lbs, comp 9-21-46 at 10,347.

Jefferson County—NW Hampshire Distillate

LYKES BROS. STEAMSHIP CO., INC.

OWNERS AND OPERATORS AMERICAN FLAG VESSELS

Service from U. S. Gulf ports, the natural gateways for the oil and oil well equipment industries of the Midcontinent and Gulf Coast areas.

Serving the oil industry and its allied industries with dry cargo transportation to important oil producing, refining and consuming areas.

LYKES WEST INDIES LINES

Venezuela, Curacao, Aruba — Cuba, Haiti, East Coast Colombia, Panama — Canal Zone, Puerto Rico, Dominican Republic

LYKES WEST COAST SO. AMERICA LINE

West Coast Colombia — Ecuador — Peru — Chile

LYKES AFRICA LINE

Capetown, Port Elizabeth — East London, Durban — Lorenco Marques

LYKES CONTINENT LINE

La Havre, Antwerp, Rotterdam, Gothenburg — Copenhagen, Stockholm, Malmo, Abo

LYKES U. K. LINE

Manchester, London — Liverpool

LYKES ORIENT LINE

Philippines — China, Japan

LYKES MEDITERRANEAN LINE

Barcelona • Genoa • Venice • Trieste • Piraeus

Lykes offers regular sailings from Houston and Galveston, the natural ports of exit for oil well supplies—oil field equipment—oil refinery requirements for Venezuela, Curacao, Aruba and East Coast Colombia and sailings from Houston and New Orleans to West Coast Colombia, Ecuador, Peru and Chile.

Please communicate with our offices for space and rates.

GENERAL OFFICES:

NEW ORLEANS — HOUSTON — GALVESTON — NEW YORK

BRANCH OFFICES: Baltimore, Beaumont, Birmingham, Chicago, Corpus Christi, Dallas, Kansas City, Lake Charles, Memphis, Milwaukee, Mobile, Port Arthur, St. Louis, Tampa, Washington, D. C., San Juan, Havana.

Ship Via Gulf Ports!

Air-cooled

(Minimum Maintenance)

Sheppard

(Simplified Operation)

Diesel

(Maximum Economy)

Generating Set

(For Night Operations or Standby Power)

This smallest of Diesel-powered generating sets is always ready to produce low-cost lighting or auxiliary power—from the moment it's out of the crate. It requires very little maintenance because the 2,000 watt generator is driven by an air-cooled 3¾ H.P. Sheppard Diesel. Write for more interesting facts about the only air-cooled diesel-powered generating set available.

R. H. SHEPPARD COMPANY, INC.
21 Middle Street, Hanover, Pa.

DIESEL'S THE POWER—Sheppard's THE DIESEL!

Discovery: McCarthy O&G Corp.'s W. C. Tyrrell Trust 4, 700 fr sl 1760 fr el n½ sect 82, W. D. Dunshie sur, 1040.3-ac lse, perf 140 shots 10,238-252, flow 4,600,000 gas, 52-gr dist, no gge, ¼-in. comp 9-13-46 at 10,563.

WESTERN CANADA WILDCAT

Central Alberta Plains—Elk Point Failure: Anglo Canadian-Home Oil-C&E Corp.'s Elk Point 2, lsd 3 11-57-6w4th, abnd 9-24-46 at 4359.

WILDCAT STARTS

ARKANSAS

St. Francis County: Coker-Martin & Beal's Bryan 1, 520 fr s&el 17-4n-3e, 3½ mi s of Forrest City, lcn.

CALIFORNIA

Kern County: L. S. Gilmour & Assoc.'s Corey 53, 13-30s-28e, Mt View area, foundation.

M. R. & M. Syndicate's Tarabino 3, 5-29s-29e, S. Round Mt area, dr.

Seaboard Oil Co.'s Seaboard-Bandini 3-21, 21-28s-20e, Bacon Hills area, gr.

Tide Water's Fee 65-18, 18-25s-20e, Kettleman Hills-South Dome area, gr.

Union Oil Co.'s Di Giorgio 62-3, 3-31s-29e, S. Mt. View area, ru.

Fresno County: Pacific Western Oil Corp.'s Brix-Francis Community 1, 16-17s-18e, Lanare area, gr.

Orange County: A. W. Lyddon, Holtz 7-1, 7-6s-10w, Huntington Beach area, lcn.

Signal Pet. Co. of Calif.'s Deeble 1, 18-6s-10w, Huntington Beach area, dr.

Los Angeles County: Texas Co., Op.'s Gardena Community 9-1, 26-3s-14w, Gardena area, lcn.

COLORADO

Baca County: Skelly's Glasgow 1, nw nw nw 22-33s-44w, drlg 890.

FLORIDA

Gadsden County: Havana Syndicate's A. M. Butler 1, se sw 30-3n-1w, ru.

ILLINOIS

Bond County: E. A. Obering's Gradiner 1, sw sw ne 33-4n-4w, lcn.

T. M. Conray's Hediger 1, ne nw ne 20-4n-2w, drlg.

Clay County: Ohio Oil Co.'s Ehlers 1, ne se ne 5-2n-7e, lcn.

Gilliam & Aspin's Bible 1, ne ne se 25-4n-6e, drlg.

Edwards County: Magnolia's Saxe 1, ne se nw 15-2s-10e, lcn.

Sam Malias' Hoeagle 1, se sw nw 22-1n-10e, lcn.

Effingham County: Nat. Assoc. Pet. Endebrock 1, sw sw ne 28-7n-7e, drlg.

Inland Oil Co.'s Luennman 1, nw nw se 3-8n-6e, lcn.

Gallatin County: B. M. Heath's Stimson 1, nw sw ne 9-9s-9e, lcn.

Greene County: Earnest Zink's Wilhoit 1, nw nw se 18-12n-13w, lcn.

Madison County: Aetna Oil Co.'s Ashawer 1, nw ne ne 29-4n-6w, drlg.

Marion County: Paul Doran's Aussicker 1, nw nw se 11-3n-1e, lcn.

Richland County: Perry Fulk's Brooks 1, se ne ne 6-2n-9e, drlg.

St. Clair County: B. W. Quick's Smith 1, sw sw se 31-3s-6w, drlg.

Scott County: Frank Scales' Tate 1, 33-13n-13w, drlg.

Shelby County: Pure's Walker A-1, 16-12n-5e, drlg.

Wabash County: G. Beuligman's Landes 1, 6-2s-12w, lcn.

Wayne County: Lohman-Johnson Drlg. Co.'s Valbert 1, nw nw sw 11-2n-6e, lcn.

INDIANA

Sullivan County: S. R. Travis et al's Pigg 1, se ne sw 29-8n-10w, lcn.

Vigo County: J. A. & L. B. Van Horn et al's Leach 1, 36-11n-9w, lcn.

J. A. & L. B. Van Horn et al's Sisters of St. Francis 1, nw se se 36-11n-9w, lcn.

KANSAS

Comanche County: Cities Service's Blattler 1, sw sw sw 13-35s-16w, lcn.

Gove County: Ray B. Phelps' Wilson 1, ne ne ne 16-12s-30w, mim.

Stafford County: Phillips' Waters 1, sw sw se 33-24s-14w, lcn.

Sumner County: Deep Rock's Watkins 1, ne ne se 22-32s-4w, brr.

KENTUCKY

McLean County: Terrell & Oglesby's Hoagland Heirs 1, 1-L-27, lcn.

Francis D. Wicker's West 1, 21-L-27, drlg.

Miller & Shiarella's Howell 1, 8-M-27, drlg.

NORTH LOUISIANA

Franklin Parish: J. K. Wadley-J. M. Forgotson's Breech Lbr. Co. 1, c se se sw 18-16n-8e, ¾ mi nw S. Big Creek fld, Paluxy test.

LaSalle Parish: Placid Oil Co.'s Hailey Est. 1, 660 fr sl 760 fr wl 7-7n-4e, 4000-ft test, drlg 610.

Madison Parish: Atlas O&R Co.'s Dhu Thompson 1, c se sw 21-17n-10e, 1½ mi se Delhi fld, drlg 355.

C. H. Osmond's Anderson-Tully Lbr. Co. 1, c se se 28-17n-11e, 9 mi e 1 mi n Tallulah, 6500-ft test.

Natchitoches Parish: E. H. Demetrio's Prudential Ins. Co. 5, se 16-10n-9w, 1 mi w Allen, 1850-ft test.

Ouachita Parish: M. W. Shriver Co.'s Mrs. H. H. Coon et al 1, c sw sw 1-16n-1e, 13 mi sw Monroe.

Richland Parish: Houston Oil-British-American's E. C. Godfrey et al 1, se nw 25-16n-6e, 1st Gienrose test.

Atlas O & R Co.'s R. E. Phillips 1, c nw se 25-17n-9e, ½ mi s Delhi fld, 3500-ft test.

Winn Parish: H. L. Hunt-Nebo Oil Co.'s Goodpine F-135, 1980 fr sl 660 fr el 35-11n-5w, 1 mi s 12 mi w Winnfield, 9000-ft test.

H. L. Hunt-Nebo Oil Co.'s Goodpine F-134, 1980 fr s&el 9-13n-5w, 6 mi se Saline, 9000-ft test.

SOUTH LOUISIANA

Beauregard Parish: Barnsdall Oil Co.'s Long Bell Lbr. Co. 1, c nw sw ne 1-6s-10w, 4 mi n Gordon fld, mir 13,000-ft test.

Cameron Parish: Magnolia's Lutcher 1-C, start nec sect 24 go 1320 s 550 w to lcn in 24-14s-11w, 4 mi ne Mud Lake gas-cond prod, bldg rds, 12,000-ft test.

MICHIGAN

Allegan County: Circle Drlg. Co.'s Gile 1, sw sw sw 9-1n-14w, dr.

Arenac County: Mich. Oil Co.'s Mathews 1, ne nw sw 27-19n-3e, lcn.

Bay County: H. E. Bell's Keir 1, nw ne se 31-16n-3e, rig.

Isabella County: J. V. Wicklund's Gamble 1, nw nw ne 23-16n-5w, lcn.

H. E. Bell's Meyers 1, nw sw ne 36-13n-4w, dr.

Van Buren County: S. L. Godfrey's Thomas 1, sw ne nw 7-1s-15w, dr.

Harry Stroud's Biermann 1, nw sw sw 3-2s-14, lcn.

MISSISSIPPI

Forrest County: H. H. Duck & J. W. Hughes' C. O. Herchenhahn 1, nw sw 13-5n-12w, lcn.

Jefferson County: California Co.'s W. G. Greer 1, sec sw 10-9n-4e, lcn.

Sharkey County: Stanolind's School Land 1, nwc 16-11n-15w, lcn.

NEBRASKA

Morrill County: W. C. Emrich Co.'s Nerud 1, c se se 21-19n-51w, mim.

OHIO

Morgan County: Industrial Gas Corp.'s Frank Northrup 1, ne ne 9, Malta Township, lcn.

Industrial Gas Corp.'s H. H. Bankes 1-C, nw ne 20, Deerfield Township, lcn.

Lorain County: Ohio Fuel Gas Co.'s Edward Sanderson 1, Lot 24, Huntington Township, lcn.

OKLAHOMA

Carter County: Amerada's Smalley 1, ne ne ne 19-4s-3w, drlg 340.

Choctaw County: H. F. Paul's Norwood 1, nw sw nw 17-5s-16e, drlg.

Cotton County: S. D. Johnson et al's Simon 1, ne se nw 9-3s-11w, drlg.

C. B. Richardson's Dodge 1, sw sw ne 4-4s-10w, drlg 900.

Hughes County: B. C. Deardorff's Miller 1, se se se 5-7n-9e, c&p.

Lincoln County: Olson Drlg. Co.'s Maston 1, nw se sw 35-14n-4e, lcn.

Murray County: Anderson-Prichard's Jones 1, ne se nw 30-1n-2e, lcn.

McClain County: Sinclair-Prairie's Garrett 1, nw sw se 13-5n-2w, lcn.

Lewis Oil Co.'s Gordon 1, se se ne 21-7n-2w, drlg.

Osage County: Ohio's Osage 1, se sw sw 1-22n-11e, lcn.

Pawnee County: Gillespie & Sons' Bergdoll 1, se se nw 23-21n-6e, mim.

Payne County: Fleet & Roodhouse's Ball 1, ne ne sw 10-18n-3e, spud.

Pontotoc County: Deep Rock's Bond 1, ne nw ne 23-4n-4e, lcn.

Belgan Oil Co.'s Britt 1, se sw sw, lcn.

Seminole County: Manahan Oil Co.'s Harris 1, ne se sw 21-8n-7e, rur.

Sherrod & Apperson's Barnard 1, se sw ne 23-8n-8e, lcn.

H. B. Pate's Phillips 1, se ne ne 8-9n-6e, c&p.

Cimarron County: Pure's Phillips 1, sw se nw 31-5n-8eCm, lcn.

Cotton County: James N. Crofton's Champion 1, ne nw ne 31-1s-11w, drlg.

Whatley & Barbre's Parrish 1, ne nw ne 13-2s-12w, lcn.

Whatley & Barbre's Bates 1, sw sw ne 28-2s-12w, lcn.

G. B. Howell's Butler 1, se sw se 24-3s-11w, lcn.

W. M. Ungerman's Campbell 1, sw sw nw 4-4s-10w, rur.

L. H. Choate's Binson 1, nw se sw 22-4s-11w, lcn.

Garvin County: Helmerich & Payne's Newbern 1, ne ne ne 33-4n-3e, lcn.

Lincoln County: Texola Drlg. Co.'s Well 1, ne ne se 17-14n-3e, lcn.

McIntosh County: Texola Drlg. Co.'s Cannon 1, cne se 7-11n-17e, lcn.

Okfuskee County: Hall, Miller & Rodgers' Morris 1, se nw nw 29-10n-9e, rur.

Oklahoma County: Stanolind et al's Macklin 1, se se nw 1-13n-1w, mir.

Double R Drlg. Co.'s Reinhardt 1, sw sw nw 5-14n-1e, wot.

WEST TEXAS

Dawson County: Ray A. Albaugh et al's Lillian Scanlan-Stanolind 1, c sw sw E. L. & RR. 85, blk M, 5000-ft rotary test.

Ector County: Gulf's Goldsmith 421-E, 1992 nsl 666 wel T&P Ry. 15, blk 44, T-1-S, offset Goldsmith fld San Andres prod, mim for 10,500-ft Ellenburger test.

Pecos County: Peck-Penn and Richardson's W. R. Tyler 1, 330 out sec H&GN Ry. 12, blk 8, 2750-ft cable test, dr 615.

Terrell County: John T. Perkins-P. B. Tierney's Lee McCue 1, 2310 nsl 730 wel E. L. & RR. 3, blk 152, 2½ mi nw Sanderson, 1000-ft cable test.

Winkler County: Stanolind's Sealy-Smith 15-A, c ne ne sect 88, blk A, G&MMB&A sur, 6500-ft rotary test.

WEST CENTRAL TEXAS

Callahan County: Hedrick Oil Co.'s R. D. Williams 1, 330 out swc nw ne sect 64, Bayland Orphan Asylum Lands, 2150-ft cable test.

Ted N. Ivey-H. F. Burton's L. J. Gorsuch 1, 750 snl 150 wel S. P. Ry. 1, blk D, 1650-ft cable test.

H. F. Pettigrew et al's S. F. Philley 1, 330 snl 960 wel sect 17, Blind Asylum Lands, 2000-ft cable test.

Fisher County: Horne Oil Co.'s J. W. Wheeler Jr. 1, 330 out nec Geo. Creath sur 221, 4500-ft Palo Pinto test.

NORTH TEXAS

Archer County: L. T. Burns et al's J. H. Rayborn 1, 3850 snl 1530 ewl S.P. Ry. 3, 3 mi se Dundee, 2000-ft rotary test.

Frank Wood and A. R. Dillard's Ann Mangold 1, 330 wel 1320 snl blk 8, Mangold sbdn, 1 mi n Mankins, 5100-ft test.

Grace & Grace's B. E. Cooper 1, 150 out swc n½ blk 6, Isaac Holeman sur, 1300-ft test.

Baylor County: E. B. Clark et al's Claude Cowden 1, 330 out nwc T&NO Ry. 92, lcn.

Clay County: L. T. Burns et al's C. I. Graner 1, 330 out nwc blk 7, Calhoun CSL sur, lcn.

Jack County: American Liberty Oil Co. (was L. T. Burns') M. N. Garrett 1, (OWDD) 450 wel 350 nsl of nw se BBB&C Ry. sur, otd 803.

Montague County: W. W. Chambers et al's G. W. Taylor 1, 450 out sec of 108-ac of 217-ac tr, T. Scott sur, 3¼ mi w Spanish Fort, 2000-ft rotary test.

Nu-Enamel Oil Operating Co.'s Geo. & Roy Perry 1, 1000 ft fr nel nwl of L. S. Farrer sur, 3 mi w St. Jo, 7000-ft test.

Wichita County: Akin & Dimock's E. G. Hardin 1-A, 1750 snl 1900 ewl O. Farrish sur, testing 1322-26, td 1407.

Wilbarger County: Frank Wood et al's J. R. Rollans 1, 2803 nsl 2971 ewl H&TC Ry. 81, blk 14, 3000-ft rotary test.

EAST TEXAS

Franklin County: Humble's R. L. Jaggers 1, 660 out nec 144-ac tr, 660 wel 3200 snl of John Humphries sur, 5 mi e by s Mount Vernon Travis Peak test, dr 365.

TEXAS PANHANDLE

Parmer County: Oil Well Drlg. Co.'s Tharp 1, c se nw sect 40, blk A, State Capitol Lands, 4 mi ne Farwell, 7500-ft Ellenburger test, dk.

SOUTH CENTRAL TEXAS

Atascosa County: Magnolia's E. A. Kinsel 1, 660 fr ne&sel G. B. Tankersly sur 468 in m/ely/e cor of sur, 6600 s sw Muil fld prod, 3000-ft test.

H. R. Smith-Skinner & Eddy Corp.'s Mrs. Ada Tom 1, 1400 fr nel 3160 fr sel John Benson sur 148, 1515.9-ac tr, 9000 ne Fashing fld, ru 4000-ft test.

Harris S. Stahl's Suzanna Pratt 1, 900 fr sl 330 fr el 176-ac lse, F. de la Garza sur 46, 2500-ft test.

Gonzales County: Quintana Pet. Corp. et al's Alfred Speickermann 1, 335 fr swl 1282 fr nwl 145-ac lse, Wm. Newman sur, ru 14,000-ft test.

Zavala County: David S. Ring's Chas. D. Matthews 1, 330 fr s&wl blk 15, sect 20, I&GN sur, blk 2 on 5400-ac lse, 4500-ft or Edwards li test.

SOUTHWEST TEXAS

McMullen County: Jess McNeel's Fee 2, 330 fr nl tr 2050 fr nl 1385 fr el CCSD&RGNG sur 231, drlg 750 on 5000-ft test.

Webb County: Chas. H. Houston-Joe S. Mellard's D. D. Hachar 1, 2500 w 2173 s fr nec Hachar Rch in Porc 48, 2500 w alg nl s½ Porc 47 fr intersection with Laredo-Zapata highway th 2173 s to lcn on Standard of Tex. farmout, mi 4700-ft test.

LOWER TEXAS COAST

Bee County: S. Donzis' Holzmark 1, 1380 at ra fr nwl 1435 at ra fr swl J. A. York sur 330 fr nwl 1841 fr nely/nel 282.52-ac lse, 3¾ mi sw Holzmark fld disc, 3600-ft test.

Goliad County: Sun's Emil Els 1, 660 fr ne&nwl 200-ac lse 225 fr sel 1400 fr nel Vincente Ramos sur, 4000 nw Magnolia's Boyce 1 gas-cond disc, 5700 w sw Atlantic's Altman 2, nearest oil prod, 8200-ft test.

Jim Wells County: Haynes B. Ownby Drlg. Co.'s Lester Moore 1, 660 fr nl 660 fr wl N. Gossett sur 98, 660 fr n&el 462.75-ac lse, ½ mi w Armagosa shallow gas prod, 6800-ft test.

Live Oak County: Henshaw Bros.-E. H. Smith's H. N. Schwartz et al 1, 330 fr sel 330 fr swl 200-ac lse, John McMullen sur, 2 mi ne Lucas gas fld, drlg 725 on 4600-ft test.

UPPER TEXAS COAST

Brazoria County: John B. Coffee-Holmes Drlg. Co.'s A. P. George 1, 2500 n of W. Columbia prod, 2930 fr el 830 fr sl 927-ac tr, on 145.7-ac lse, 7900-ft test.

Ft. Bend County: Goldrus Drlg. Co.'s Otto K. Moehle 1, 330 fr sel 1263 fr swl sect 25 E. P. Olcott sur (H&TC), 1 mi n of w prod at Needville, 7500-ft test.

Matagorda County: Pure's State of Tex Blk 308-1, 660 fr s&wl blk 308, 640-ac lse, N. Matagorda Bay, 6000-ft test.

Wharton County: D. M. Wallace's J. W. Kubele 1, 330 fr s&wl 190-ac tr, H&TC sur, nw Kubella prod, 6000-ft test.

UTAH

Uintah County: B. V. Bullock's Angus 1, c sw ne 36-1s-1e (SIM), Vernal area, drlg 280

WYOMING

Carbon County: Wasatch-Cameron-Phillips' Johnston 1, sw nw nw 24-26n-89w, E. Bailey Dome, 5000-ft test to Nugget, cellar.

WESTERN CANADA

Central Alberta Plains—Elk Point: Anglo Canadian-Home Oil-C. & E. Corp.'s Elk Point 3, lsd 15 35-57-5w4th, rig.

Rusylvia: W. G. DeKoch's Iscris-M 3, lsd 5 22-54-6w4th, drlg.

GOODE UNIONS *give* BETTER SERVICE

THEY'RE *Doubly Sealed* AND *Fully Tested*

Goode **"Double Seal"** Wing Unions will stay in service longer and stand more abuse. Double seats in each union give more protection against leaks caused by abuse and damage in handling. Each union is individually tested to its full working pressure before shipment. Ample wrench and tong room is provided on hub. Three wing lugs provide easier and faster make-up. Quality forgings and castings, precision machine-work and close inspection assure dependable unions **every time.**

Specify "Goode" on your union requirements and get these extra benefits at no extra cost.

Furnished in a complete range of sizes, in test pressures from 1000 through 10,000 p.s.i. If your supply store cannot furnish, write direct.

Export Representative: HUNT EXPORT CO., 19 Rector St., New York, N. Y., Avda Roque Saenz Pena 832 Buenos Aires, Argentina, S. A.
California Distributor: Bettis Rubber Co., Ltd., 1557 South Esperanza St., Los Angeles, Calif.

GOODE "Double-Seal" WING UNION

GOODE EQUIPMENT CO., Inc.
1419 Carr Street Capitol 6338
HOUSTON, TEXAS

The OIL WEEKLY'S TRADING POST

USED EQUIPMENT FORUM

CLASSIFIED ADS . . . EQUIPMENT . . . SERVICES . . . PERSONNEL

FOR SALE

■ 5 Complete Reda Pumping Units. Cables like new. 75 and 97 H.P. Motors. Max Steinbuchel, 1005 Park Place, Wichita 4, Kansas. Phone 5-6082.

■ For Sale: Houston Ship Channel Frontage; 600 acres, high ground, 1700 feet on Channel, vicinity San Jacinto State Park, priced right to settle estate. Agents welcome. Box 71, The Oil Weekly, Houston, Texas.

■ **For Sale: 7500' Power Drilling Rig, equipped 876 Portable Rig Drawworks, NKU Waukesha Motors, Derrick, Rotary, Swivel, Travelling Block, 10" Cameron B O Preventer, Drill Pipe Tongs, Weight Indicator.....$30,000.00 1—10 Ton Model 426 International Tandem Truck Completely equipped and rigged for heavy oil field hauling, and with Tandem Pole Trailer, in good operating condition..$4,000.00 Phone Mr. Booker 2-2685 Baton Rouge, Louisiana or write P. O. Box 1268, Baton Rouge.**

■ CABLE DRILLING EQUIPMENT for deep or shallow work, Standards, Wichitas, Ft. Worths, Stars, Sullivans, Derricks, Cable, Full stock good used tools, S. W. Pressey, Pueblo, Colo.

FOR SALE

R. M. WOLFE BOILER & WELDING WORKS
5100 Belle Isle Avenue
Oklahoma City, Oklahoma

$50,000.00 Sale of all field and shop equipment, also stock of new material will start October 3, 1946, priced and sold piece by piece at location until sold. 7 Field Trucks equipped with engine driven air compressors, engine driven arc welding machines and acetylene generators. Shop Equipment: 7 Arc welding machines, 13-inch metal lathe, 24-inch heavy drill press, power sheet metal roll, large air compressor with 50 H.P. motor and starter, flue scaling machines, tube welding machines and furnaces, drills, grinders, riveters, flue machines and hundreds of other items.

Charles L. Adamson, Sales Representative

■ "Famous Texas Oil Fire" picture in colors $2.00 . . . 921 World Bldg., Tulsa.

■ Complete Rotary Drilling Rig ready to go: Giant Drawworks, Waukesha Engines (Butane), Gardner-Denver slush pump, drill pipe, derrick, etc. Many other items. Ruth Giddings Hendrix, 5800 McCommas, Dallas 6, Texas. Tel. T-3-8532.

FOR SALE

50— 500 Barrels
10— 1,000 Barrels
20— 5,000 Barrels
4—10,000 Barrels

Heavy A.P.I. New closed bolted type steel tanks now located at Ogden, Utah. Can quote reasonable prices in order to move from present premises at once.

JOS. GREENSPON'S SONS PIPE CORP.
National Stock Yards, St. Clair County, Ill.

FOR SALE

8000 gal. capacity Class III Tank Cars. Excellent tank shells for storage. Deliver on wheels.

KEITH RAILWAY EQUIPMENT CO.

LONGVIEW, TEXAS

FOR SALE

Complete Refinery 1000 Bbl. Capacity in stand by condition. Skimmer-Cracker with outside soaking bank. Drum type ethyl blending plant. Crude gathering system pump station and delivery lines. Loading rack on railroad. 45,000 Bbl. Steel storage. Plant located 14 miles north of Abilene, Texas, on Highway 277.

MOUTRAY OIL CO.

BOX 29

ABILENE, TEXAS

FOR SALE

U. S. ARMY 12 inch HIGH CUTS

Made by BASS, PACKARD, CLAPP, FLINT, other famous makers.

$9.45

POST-PAID

BRAND NEW • $16.50 VALUE

Perfect for sports, rugged outdoor work—damp or cold climate. Waterproof. Full triple leather soles, hair felt insoles, one-piece leather tongue. Genuine rawhide laces. Sizes 6 to 12½, B to EE. Order one size smaller than dress shoes due to oversize construction. Money back if not satisfied. Ask the GIs who wore them.

Regulation U. S. Army O. D. wool blankets, 66 x 84, weight 4 lbs. Reissue—OK. for use as is $5.98
New Army ski boots $7.95

NATIONAL ARMY STORES

DEPT. C, 110 MARGARET STREET
PLATTSBURGH, NEW YORK

It's New . . . Check It!

PIPE GRINDING MACHINE designed and built to give pipe line contractors maximum service in polishing the bevel on plain end pipe in preparation for welding. The machine can be placed on pipe easily and quickly, and will clean the bevel on 24-inch pipe in 15 seconds, whereas a man with file would have to work at least 15 minutes. The grinder is constructed for durability, light weight, effectiveness and economy. Electrically driven, it may be operated from electric welding machines on the line.

The Machine was perfected, and now being manufactured by Wichita Tool Repair Co., of Wichita Falls, Texas, under License from O. R. Hall, Inventor.

■ One steam crane R25, American Hoist and Derrick Company, 50 tons at 60 ft. radius. Mounted on steel barge, 149 x 49 x 9. All in first class condition. One steam crane, American Hoist and Derrick Company, 10 tons, 30 ft. radius. Mounted on steel barge, 100 x 26 x 6. In good condition. Box 67, c/o The Oil Weekly, Houston, Texas.

■ 600 HP at 1200 RPM Sterling Viking II heavy duty marine engines FW cooled little used, pair $1900 each, Church Coal Co., Taunton, Mass.

FOR SALE

EQUIPMENT FOR SALE

One complete 20,000 barrel per day diesel pumping station consisting of four units, each unit having a Gould 4½ x 12" horizontal duplex double acting pump connected to a 100 H.P. single cylinder horizontal 200 R.P.M. DeLaVergne engine, complete with pumps and air compressor. Steel clad building with crane still erected. Can quote a *bargain* price.

Also 250 to 10,000 barrel, new closed A.P.I. bolted type steel tanks.

New and guaranteed used steel pipe and tubing.

JOS. GREENSPON'S SON PIPE CORP.

Nat'l. Stock Yards

St. Clair County, Ill.

NEW 16" BLOCKS

Triple and Quadruple Cast Iron Sheaves. Steel Shell. Self Lubricating. Bronze Bushed. Loose Side Hook and Becket. For 1" Wire Rope. Priced Right.

Wire, Write, or Phone

Glazer Steel Corporation

2100 Ailor Ave. Knoxville, Tenn.

Phone 3-0738

HELP WANTED

■ Wanted: Geological Draftsman. State age, experience and other qualifications. Work with independent oil company. Write Fullerton Oil Company, Box "H," Hobbs, New Mexico.

■ WANTED: Seismologists for division office of major oil company. Men with considerable experience as party chiefs preferred. These positions very attractive for men with families who want to settle in permanent locations in Texas and Oklahoma. Give full details of education and experience in first letter. All replies will be held confidential. Reply Box 69, The Oil Weekly, Houston, Texas.

■ Partner in Gravity Meter Exploration work who has contacts with Oil Companies and can obtain contracts in this field. I have had two years experience in Gravity Contracts plus fourteen years in Engineering. Will finance and supervise the Gravity work personally. Have excellent experienced crew ready at present time. Write Box 70, The Oil Weekly, Houston, Texas.

■ Manufacturers representatives to sell established line of oil field specialties on commission basis in Gulf Coast-South Texas area, North Texas-Panhandle, also Illinois and Michigan. Give full information regarding past experience, present lines and references. Box 1923, Tulsa, Oklahoma.

HELP WANTED

■ DRAFTSMAN qualified in drafting geological maps for publication and in map compilation and to supervise other draftsmen. Permanent; state minimum salary. Address Box B, University Station, Austin, Texas.

■ District Landman wanted for Rocky Mountain area. Large independent oil company established in producing, refining, and marketing, plans to open a district office in the Rocky Mountain area. Applicants must be well experienced in trading and title work, and have knowledge of development and production of oil and gas. Box 73, c/o The Oil Weekly, Houston, Texas.

DISTRICT GEOLOGIST

Eastern Venezuela. College graduate in Geology. 8 to 10 years' experience, preferably several years supervising Geologic aspects of wildcat and field development wells. Foreign experience and Spanish desirable. Write to

The ATLANTIC REFINING CO.
Rm. 900, Box 7258, Phila. 1, Pa.

EXPERIENCED PARTY CHIEFS, SEISMOLOGISTS AND OBSERVERS

are wanted for foreign seismic parties.

UNITED GEOPHYSICAL COMPANY, INC.
595 East Colorado Street, Pasadena 1, California
822 Thompson Building, Tulsa 3, Oklahoma

MICRO-PALEONTOLOGIST

Fully trained assistant to make stratigraphic correlation of well and surface samples. Degree. 3 to 5 years' experience. Write to

The ATLANTIC REFINING CO.
Rm. 900, Box 7258, Phila. 1, Pa.

DRAFTSMEN

DESIGNERS AND CHECKERS
with experience on
Structural Steel and Concrete
Process Piping
Pressure Vessels

The Boston office of E. B. Badger and Sons Co., internationally famous chemical engineering organization, offers qualified men well-paying positions. This is a fine opportunity for men who would enjoy working in congenial surroundings and with pleasant cooperative associates. A personal interview can be arranged in your city. This is not a temporary position. Write, giving full details of background and experience, salary wanted, etc., to

Mr. William M. Rose, Personnel Director
E. B. Badger and Sons Co.
75 Pitts Street, Boston, Mass.

WANTED

■ Wanted second hand or obsolete transits preferably with 5 inch magnetic needle. Reply Box 72, c/o The Oil Weekly, Houston, Texas.

SITUATION WANTED

■ Geologist: Technical graduate engineering and geology. Eighteen years' experience, with last four years in surface and subsurface petroleum geology in the Rocky Mountains, New Mexico, and West Texas. Employed. Interested in position as surface geologist, U. S. or foreign. Box 74, c/o The Oil Weekly, Houston, Texas.

■ Ex-Army major, pilot, BA and MS degrees in Geology, 2½ years geological experience, age 30, married, 2300 hours pilot time accident free. Instrument rating, commercial, single and multi-engine land. Checked out in B-17, B-25, C-45, C-46, C-47, A-20, L-4B, L-5, C-61, PT-17, PT-22 and AT-6. Transport and ATC experience six months. Completed probation with and presently employed by major airline. Desire connection with oil or tool company combination sales-geology-piloting. Domestic or foreign. Minimum starting salary $6000 yearly. Box 66, c/o The Oil Weekly, Houston, Texas.

FOR RENT

POWER PUMP

New 5 x FXO Gardner-Denver powered with new Waku Motor

JACK KNIFE DERRICK

126 Foot Lee C. Moore

FOR RENT

EARLE ADKISON

Box 814 Houston Fairfax 9339

SERVICES

INCREASE YOUR PRODUCTION

By the "Patten Process of Chemical Expansion" for cleaning liners and screens in the well units now servicing Louisiana, South Texas and Gulf Coast fields. Write for Free Information Booklet.

OIL WELL ENGINEERING CO.
531 Esperson Bldg.
Houston, Texas

LEASES, DRILLING, ACREAGE, ETC.

■ PRODUCTION WANTED—Farm out of producing properties in Louisiana, Gulf Coast or South Texas on over-riding royalty or oil payment bases that justifies work over of wells, describe fully, all correspondence and information will be treated in strict confidence. Oil Well Engineering Company, Houston, Texas.

■ Four of us have 10,000 acres of land leased for oil and gas in northeastern part of Sumner County, Tennessee, that joins Allen County, Ky., which has produced a great deal of oil at shallow depths of 325 feet and less. Producing formation in Allen County, Kentucky, is of Silurian age. We will sell our leases, which are 5 and 10 year leases, take a royalty in oil and gas; or will give half our leases to some one that will agree to drill both shallow and deep test wells. An oil man from Tulsa, Oklahoma, stated around 25 years ago that oil in Allen County, Kentucky, was migrating upward from a deep pool of oil. This man agreed to drill four test wells 4000 feet deep at that time if farmers would give him the leases. If interested in making a deal write, wire or call, Telephone No. 134-W, W. B. Dye, Jr., Portland, Tenn.

READ THE
Trading Post Section
FOR EQUIPMENT, SERVICES, PERSONNEL

"Best Bet Yet"

Here's a compact Sucker Rod Wiper designed as Well Pullers wanted it. Short overall height, 4", just right height for wrenching rods. Weight complete, only 29#. Easy to handle, comes mounted on pony rod ready to be used. Tough, natural rubber wiping webs squeegee rod, box and square free of oil. No oil leaves hole or flips on crew... Rubbers stand enough pressure to take oil to tank or sump if well flows. Wipes any size rod, ⅝" to 1¼".

Duo-Wipe style, code: SUBZONE, shown above, has two wiping elements. Quadra-Wipe Style, code: SUBSOLAR, has four rubbers for use with extra-low gravity oil. Both styles make up on standard tubing sizes at the well head.

Cut-away drawing shows sturdy construction. Handy Table Plate Head, available for both models, holds rod tools and elevators.

Write for Catolog No. 310

Specify
PATTERSON-BALLAGH
A DIVISION OF BYRON JACKSON CO.
"Best Bet Yet"

SUCKER ROD WIPERS

1900 E. 65th Street, Los Angeles 1
6247 Navigation Blvd., Houston 11
808 Graybar Bldg., New York 17
210 Post Street, San Francisco 8

SQUEAKS from the BULL WHEEL

Breaking the Fast

"Honeymoon sandwich, please."
"What's that?"
"Hot chicken and no dressing."

Casey, Jr.

A squaw and her papoose were standing on the station platform when the train rolled in. A woman leaned out the window and tried to strike up a conversation. "Him Injun?" said she, pointing at the babe.

"Him part Injun, part engineer!"

Life Is Like This

"Who was that blonde I saw you with last night?"

"I dunno. I opened my billfold and there she was."

This Curious World

A GI who speaks seven languages found himself a girl in the jungles. He wrote home: "She doesn't understand American, French, Spanish, Italian, German, Portugues or Russian—but she understands."

"I'll bet she wouldn't marry me," he sighed. But she called his bet and raised him three.

Easiest but most unpleasant way to acquire a big vocabulary is to marry it.

The beauty shops, the shoe shops, the hat shops and the dress shops have managed to take 20 years off a woman's looks—but you can't kid a long flight of stairs.

A wallflower is a girl who wears a sweater to keep warm.

She entered two contests—one for the most beautiful back and the other for the most beautiful bust. And she got so excited she didn't know which way to turn.

"Lips that touch wine shall never touch mine," vowed the co-ed. Then she graduated from college and taught school for years and years and years.

Some girls prefer to stay single, but most of them would rather knot.

Signs of the Times

"Who was that lady I saw you with in a sidewalk cafe last night?"

"That was no cafe. That was our furniture."

Style Note

A man had been waiting patiently in the post office, but could not attract the attention of either of the girls behind the counter.

"The evening cloak," explained one of the girls to her companion, "was a redingote design in gorgeous lama brocade with fox fur and wide pagoda sleeves."

At this point the long-suffering customer broke in with:

"I wonder if you could provide me with a neat purple stamp with a dinky perforated hem, the tout ensemble deliberately treated on the reverse side with mucilage. Something at about three cents."

Seeking Proof

She: "Have you heard those awful things people are saying about me?"

He: "Sure, Baby. Why do you suppose I'm here?"

It's Coming to This

"You can't go wrong on this horse, Mister. He's sound of wind, gentle as a lamb and strong as an elephant."

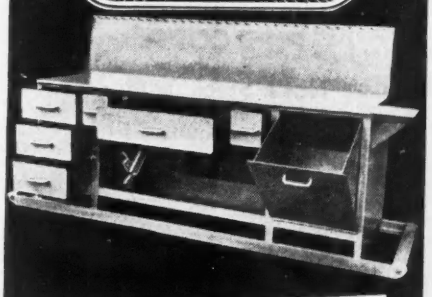
"Yeah, but will he be tender?"

Good Substitute

When Mary married, the church was crowded. Following the ceremony, friends began to gather around to kiss the bride. After a hectic half-hour, the breathless girl looked narrowly at a little man and said: "Say, I don't know you! Why are you kissing me?"

"I dunno ma'am," said the man meekly, "when I joined this line around the corner, I understood it was for beefsteak!"

OWEN



Type "A" Work Benches
Finest in the Field!

Owen Type "A" Work Benches are all-steel, all-welded and mounted on rigid steel skids. Drawers are roller-mounted, with forward stops and a central locking mechanism. Guards prevent water and oil from draining in on tools. Sturdy stand provides convenient space for mounting vise. Six drawers for hand tools and instruments, a big bin for rags and steel pegs on the back apron for wrenches provide plenty of storage space.

They're the finest in the field for saving tools and providing a safe, convenient working space. Put one on each rig you operate . . . they'll "dress up" its efficiency and appearance.

SOLD THROUGH ALL SUPPLY STORES
Distributed in California by Howard Supply Company, Los Angeles, Calif.

OWEN TOOL COMPANY
ROUTE 9 BOX 800-B V-2-4341
HOUSTON, TEXAS

THE FORT WORTH LABORATORIES

Analysis of oil field brines, cores, gas, oil and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138. 823½ Monroe Street, Fort Worth, Texas

William A. Baker

William A. Baker was appointed vice president and treasurer of Shell Pipe Line Corporation. He has been in the Houston headquarters as assistant treasurer for six years. He became connected with the company in 1927, was general auditor and later assistant operations manager of Shell Oil Company. He transferred to St. Louis in 1933 as assistant comptroller of Shell Petroleum Company, and was made comptroller in 1937.

»

Clarence C. Warner, division land man for Stanolind Oil & Gas Company at Casper, Wyo., since 1933, has retired and is succeeded by **John Schalk.** Warner began in the banking business in 1906 but joined the oil industry in 1923 as land man for Mid-Northern Oil Company at Billings, Mont. He has worked in Texas and Kansas for Midwest Exploration Company, and became connected with Stanolind in 1932. Schalk has been employed by Stanolind for 12 years.

Frank M. Dawson

Allen K. Brehm

Frank M. Dawson was elected vice president in charge of operations and **Allen K. Brehm** treasurer of Carthage Hydrocol, Inc. Dawson was with The Texas Company for 18 years, and upon resigning was superintendent of the Lawrenceville, Ill., refinery. Brehm was formerly first vice president and a director of the Continental Bank & Trust Company of New York. The company will synthesize gasoline and petroleum and chemical by-products from natural gas in a $15 million plant to be erected near Brownsville, Texas.

»

John T. Higdon, Tulsa, division telephone and telegraph maintenance foreman for Shell Pipe Line Corporation, has retired after 23 years of service.

Leslie Bowling, geologist for The Union Oil Company of California at Houston, is resigning effective October 15 to become chief geologist for the William Helis organization in New Orleans. He succeeds **G. I. Atwater** who has resigned to do consulting work at New Orleans. Bowling served as secretary of the Houston Geological Society in 1941 and as president during the 1944-45 term.

Leslie Bowling

»

Dolph Simic, North Texas district geologist for Cities Service Oil Company, has resinged to become head of the geological department of the Bay Petroleum Corporation, Denver, but will continue to reside at Wichita Falls. He is succeeded by D. R. Guinn, who has been East Texas district geologist for Cities Service Oil Company.

»

W. P. Jenny, consulting geologist and geophysicist, has returned to Houston after spending several months in Europe.

PETROLEUM PRODUCTION ENGINEERING

By LESTER C. UREN

Professor of Petroleum Engineering
University of California

Volume I—Oil Field Development. New Third Edition, thoroughly revised and enlarged. During the decade that has elapsed since the publication of the Second Edition, the technology of oilfield parctice has made notable advances, necessitating a broad revision and considerable expansion in the preparation of this, the Third Edition. Wells are being drilled today to far greater depths than were possible in 1934; new and more efficient types of drilling equipment have been developed; new methods of installing and cementing casing in wells have been devised, new techniques of logging, testing and completing wells perfected; the principles governing oil field development practice have become better defined. Engineering has entered into this phase of the producing industry to a greater extent than in any previous decade, with consequent improvement in methods, equipment and efficiency.

Approximately 775 pages, 5¾ x 8¾, Price $7.00

Volume II. Oilfield Exploitation. Here are up-to-the-minute data on how to drain petroleum from its reservoir rocks, how to bring it to the surface and prepare it for shipment, how to care for and remove impurities from the crude petroleum, how to design, construct and operate pipe lines. The book is based on the author's contacts with all the important oil-producing regions of the United States.

741 Pages, illustrated, Price $6.50

Send orders to

The Gulf Publishing Company

P. O. BOX 2608 **HOUSTON 1, TEXAS**

DON'T GET BURNED UP BY NEGLECT

Heat Wears Out Oil Field Engines Fast . . . In gas fueled engines, especially, important top cylinder areas are neglected . . . lubrication is taken for granted. Here, at temperatures which break down ordinary lubricants, Marvel Mystery Oil and the Marvel Inverse Oiler *stay* on the job for you. Protection is positive.

- **Marvel Mystery Oil not only protects with *extra*-tough film strength at high heat, it combines amazing solvent action as well. Sticky gums and varnish are removed from valves, rings and guides . . . the engine *keeps clean* inside.**
- **Wear drops way off and power picks right up when lubrication is right. You'll set a new minimum in "down" time and a new maximum in engine life. Ask for the facts. Emerol Mfg. Co., Inc., 242 W. 69th St. New York 23, N. Y.**

use the

MARVEL

INVERSE OILER WITH MARVEL MYSTERY OIL

The Marvel Inverse Oiler, easily installed, proportions the flow of Marvel Mystery Oil precisely to the needs of your engine

QUICK DELIVERIES ON
STEAM CONDENSERS
and
FEED WATER HEATERS

We deliver small condensers and feed water heaters built to your specifications in days instead of weeks or months.
Call us also for expert maintenance of your condensers and feed water heaters—QUICK SERVICE.

25 Years Successful Experience

GULF ENGINEERING CO., INC.
"Service, Not Promises"
1682 INGEBORG ST. HOUSTON, TEXAS
916 S. PETERS STREET NEW ORLEANS, LA.

OIL FIELD HAULING

QUICK DIRECT SERVICE
to
• Colorado • Montana
• Wyoming • Oklahoma
• Texas • Kansas
• Louisiana • New Mexico

HILL & HILL
TRUCK LINE
P. O. BOX 2565
HOUSTON, TEXAS
Phone: Charter 4-5571

FRED M. LINK
Preferred
FM Radio
Communications Equipment
Solve your tough communications problems by using this equipment. Proved during war and doubly preferred by Communications men in all branches of the oil industry.
Ask for FRANK CONWELL, *Engineer*
Houston Radio Supply Co., Inc.
Clay at La Branch Phone C-9009
HOUSTON, TEXAS

MEN IN THE INDUSTRY NEWS

Thomas A. Norman has been appointed San Francisco district sales manager for Tide Water Associated Oil Company. He was formerly a member of the advertising department in the San Francisco office.

Ed Moore, scout for Gulf Oil Corporation at Denver, retired October 1. Moore was with Gulf and the Gypsy companies for 33 years.

George Russell Reed, employe at Shell Oil Company's Iowa gasoline plant, was awarded the Joseph A Holmes safety award for risking his life and suffering painful injuries to save the life of a fellow worker, **Raymond L. Garrett,** an act of heroism for which he has also been awarded the Carnegie Bronze Medal and $500 in cash. He saved Garrett's life by breaking his fall from the top of a still.

Howard P. Atkin and **Ray H. McLeod** have been added to the Cathodic Protection sales staff of The Dow Chemical Company, Atkin, a graduate chemical engineer from the University of Southern California, who has served four years with the Army Air Corps, is in the Los Angeles office. McLeod, graduate chemical engineer from Northwestern University, who served in the U. S. Navy, is working in the Chicago office.

F. Wayne Covault, retired superintendent of production for Amerada Petroleum Corporation in the Texas-New Mexico district, was honored by officials and field employes with a surprise banquet September 27 at Fort Worth. **E. S. Porter,** vice president and general manager, and **W. G. Ricketts,** general superintendent, both of Tulsa, were among those paying tribute.

T. P. Bartlett, representative of the Arrow Drilling Company in the Arkansas-Louisiana-East Texas district, has transferred headquarters from Shreveport to Longview, Texas, with office in the First National Bank Building.

Arthur Zimmerman, formerly connected with The Weatherhead Company as assistant chief engineer, has been appointed sales manager of The Steel Improvement & Forge Company, Cleveland. A graduate of the Massachusetts Institute of Technology, with a B.S. in mechanical engineering, he has worked along sales engineering lines with many of the aircraft gas turbine manufacturers and has been active in sales and engineering in connection with gas turbine accessories.

Arthur Zimmerman

W. C. (Bill) Johnson has been announced as sales representative for John A. Roebling's Sons Company. He will cover the oil areas of Louisiana, southern Arkansas, Mississippi, Alabama and Florida. He has been active in the oil field trade since 1928, and recently returned to the industry after serving 41 months in the Navy.

W. C. Johnson

A. J. Komich, recently discharged from the Navy with the rank of lieutenant commander, has been appointed to the New England sales staff of the Pittsburgh Equitable Meter Division, Rockwell Manufacturing Company. Before the war Komich was associated with Worthington Pump and Machinery Company.

O. H. Kristofferson, district geologist in Michigan for Skelly Oil Company, has resigned to engage in independent consulting work. He will maintain offices in Mt. Pleasant. Skelly recently closed its Michigan district offices.

G. Lee Ellis, East Texas district geologist for Stanolind Oil & Gas Company, has been transferred from Tyler to Fort Worth to become assistant division geologist.

John C. Myers, Jr., former geological instructor for The University of Texas at Austin, has accepted duty as a subsurface geologist in the university's field office at Midland.

R. A. Broomfield, Jr., former California oil man, has been discharged from the Army Air Forces after three years in the service and has opened a consulting office in Artesia, N. M. He was for 13 years an employe of Barnsdall Oil Company in California and was a vice president of the company when he left to enter the service.

Lawrence Vander Leck, petroleum consultant, has announced that **R. G. Whealton,** petroleum engineer, is now associated with him at his Los Angeles office in the Ohio Oil Building.

Deaths

C. C. Carroll, 62, manager of the Illinois producing division of The Ohio Oil Company, died of a heart attack September 29 in Marshall, Ill. He had been connected with the company since 1907, starting as a stenographer.

John Knudsen, 62, died September 28 in Los Angeles. Knudsen had been identified with the industry since 1900. In recent years he has been engaged in the oil brokerage business in Los Angeles.

Joe F. Holloway, 58, Wichita Falls district field clerk for Sinclair Refining Company, pipe line division, and an employe since May, 1918, died October 1.

Dowell Incorporated's District At Wichita Falls Is Enlarged

R. D. Shaw, general sales manager for Dowell Incorporated, has announced the enlargement of the Wichita district to include several western and southwestern Kansas gas-producing counties. This expansion requires the opening of an additional service point at Ulysses, Kansas, and the operation of the long-established Hugoton Station. This move has been made in order to consolidate service operations in the gas producing areas of Kansas.

M. E. Hanson has been made development engineer with headquarters at Hugoton. He has been located at the Great Bend office of Dowell where he was a service engineer. M. E. Heslep has been transferred to Hugoton from Dowell's Wichita Falls district. He will be in charge of station operation. A. L. Herrell will remain at Hugoton as service engineer, a position he has held for several years.

D. D. Parsons, who has been station manager at Hugoton for many years, becomes development engineer at Guymon, Okla., where Dowell maintains a station as part of its Borger district.

J. A. Cummin and W. F. Brown will continue to be district manager and district engineer of the enlarged district with offices in the Union National Bank Building, Wichita.

Houston Oil Field Material Announces Personnel Changes

The Houston Oil Field Material Company, Inc., announced that A. J. Adams has returned after approximately four years' absence. While on leave he served in the armed forces as a first lieutenant. He has been appointed assistant personnel director in Houston.

Roy W. Bythewood and O. C. Johnson have been employed as warehousemen in the sales department at Beaumont, Texas, and Mamou, La., respectively. Thomas H. Cox is employed as mud engineer in the mud and chemical department at Houston. Cox studied petroleum engineering at Tulsa University. R. E. Lunday has returned to HOMCO after an absence of approximately two years. Lunday is employed as a salesman in the Houston area.

B. D. Burts and C. M. Standridge have recently joined HOMCO as directional drilling engineers. They will work in the New Iberia, Louisiana, district. W. G. Seis and L. J. Lawrence, formerly salesmen at Victoria, have been transferred to Houston and Corpus Christi, Texas, respectively.

Lawrence A. Babin has recently been promoted from warehouseman to salesman at New Iberia, La. Jack Stone, mud engineer, has been transferred from Eunice, N. M., to the HOMCO store at Odessa, Texas. Tom C. Flowers has been promoted from maintenance man at Victoria to fishing tool operator at Houston. W. O. Smith, formerly clerk in the Houston Industrial Sales Department, has been promoted to salesman in that department. Reed Elliott has been transferred as warehouseman from Beaumont to Mamou. Jack O'Neal Massey has been promoted from warehouseman to field salesman at Raymondville, Texas.

Edward Laboratories Conduct Flow Tests on Unique Hookup

An original test hookup, believed to be the only one of its kind in existence, has been constructed by the laboratories of Edward Valves, Inc., for the computation of pressure losses through valves and piping.

The equipment was designed and fabricated after several years of study. Provision is made for tests of all types of standard valves. Readings are made on flow meters, manometers and gauges, and are tabulated for specific operating conditions. From these readings, accurate computations of pressure loss for valves of known characteristics are possible for all normal service conditions.

Manhattan Rubber Reemploys 1049 of Its Service Veterans

Manhattan Rubber Division of Raybestos-Manhattan, Inc., Passaic, N. J., has reemployed 1049 of its 1625 employes who were in the armed forces during the war. Fifty-nine were killed. This large number to leave and be reemployed represents a major undertaking by the personnel department in reemploying and retraining.

Non-Corrosive Products Firm Moves Into New Houston Plant

Non-Corrosive Products Company of Texas has moved into a new office and plant at the corner of Katy Highway and Post Oak Road, Houston. The office, warehouse and shop buildings have been completed on the 14-acre site. Seven acres will be used for expansion of the company's facilities for coating and wrapping of pipe, coating of steel storage tanks, and sandblasting oil field equipment. A. J. Mendive is president.

NEED NEW

BOOMERS for your OIL FIELD HAULING?

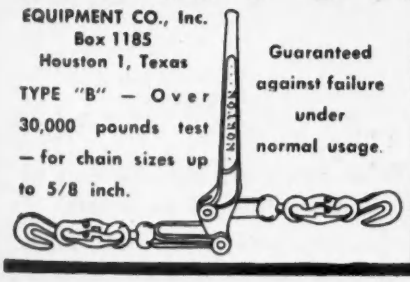
You can get them now! Norton Type "B" and Type "J" drop forged, heat treated steel Load Binders (Boomers) are ready for immediate delivery. Order them through your jobber.

NORTON

EQUIPMENT CO., Inc.
Box 1185
Houston 1, Texas

TYPE "B" — Over 30,000 pounds test — for chain sizes up to 5/8 inch.

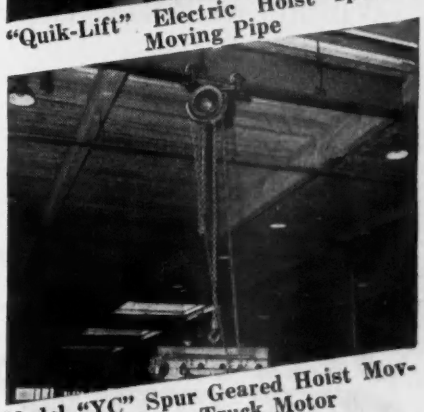
Guaranteed against failure under normal usage.



Wherever COFFING HOISTS are installed there is a noticeable saving in manhours and manpower. New uses are being found daily in all kinds of plants and industry—whether it's production, construction or maintenance.

"Safety-Pull" Hoist Pulling Concrete Forms

"Quik-Lift" Electric Hoist speedily Moving Pipe



Model "YC" Spur Geared Hoist Moving Large Truck Motor

There is a COFFING HOIST to meet your requirements. Contact your supply house for detailed information or write for our Bulletin Form 4.

COFFING HOIST COMPANY
Danville, Illinois, U. S. A.

ECOLITE-92BM

With Locking Device and Seals

TWICE APPROVED

For

DOUBLE SAFETY

APPROVED BY U. S. BUREAU OF MINES & UNDERWRITERS' LABORATORIES

—for use in atmospheres containing Methane or natural gas, gasoline or petroleum vapors. This double-safety lantern has a tamper-proof reflector and cover with locking device and seals. Throws 1500 ft. beam. Instantly ejects broken bulbs from battery circuit. Large handle—360° pivoting feature gives direct illumination where needed and leaves both hands free for work.

Now at Supply Stores

ECONOMY ELECTRIC LANTERN CO.

3100 W. Cherry St. Milwaukee 8, Wis.

HOUSTON LABORATORIES

Analytical and Consulting Chemist
Podbielniak Gas Analysis

Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils

Long Distance 267 Box 132, Houston, Tex.

ASME API ASTM AWS AISC

"Sound Welds Through Tests and Inspection"

THE WELD INSPECTION LABORATORY

Telephone Hadley 3589

3607 Fannin Street Houston 4, Texas

William M. Barret, Inc.

Consulting Geophysicists

Specializing in Magnetic Surveys

Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique.

GIDDENS-LANE BUILDING
SHREVEPORT, LOUISIANA

Standco

NO-SMOKE

STANDCO BRAKE LINING

Is the driller's best friend because it makes the easiest brake known and "feeds off" evenly while drilling. It never scores brake rims. See page 2808 Composite Catalog.

Standco Brake Lining Co.

HOUSTON

New Nomad Members

New members inducted by the New York Chapter of Nomads at its September meeting included Eugene R. Smoley, The Lummus Company; A. A. Swanson, Continental Supply Company; David C. Washburn, Export Tool Company; Ivan S. Forde, Midwest Piping Supply Company; J. M. Bridges, The Buda Company; H. Gottwald and A. L. DiGiulian, Rockwell International Corporation; James Herrick, Cardwell Manufacturing Company, Inc.; John D. Evans, Lucey Export Corporation; George O. Ives, THE OIL WEEKLY and Osmun B. Latrobe, Hughes Tool Company.

New Maps by USGS

Possibilities for stratigraphic and structural traps that may contain oil are indicated on a geologic map of the eastern part of the San Juan Basin in Sandoval and Rio Arriba counties, New Mexico, just published by the U. S. Geological Survey.

The survey also has issued a new geologic map of the northeast margin of the San Gabriel Basin in Los Angeles County, California.

The former, Preliminary Map 57, and the latter, Preliminary Map 63, of the Oil and Gas Investigations series, may be purchased at 60 cents each.

Advertisers' Index

EDITORIAL INDEX, PAGE 5

* Indicates detailed information on products and services included in 1943-44 edition of Composite Catalog of Oil Field and Pipe-Line Equipment.

Republic Supply Co. 44-45
*Rockwell Manufacturing Co. I Cover
Shell Development Co. 54
R. H. Sheppard Co. 72
Smith Contracting Co. 46
*Standco Brake Lining Co. 80
*Tank Seal Products Co. 8
Trading Post Section 74
American Association of Petroleum Geologists 80
*American Cable Division, American Chain & Cable Co. II Cover
*Baker Oil Tools, Inc. 46
Wm. M. Barret, Inc. 80
*Cameron Iron Works, Inc. III Cover
*Coffing Hoist Co. 79
*Fred E. Cooper 61
*Economy Electric Lantern Co. 80
*Emerol Manufacturing Co. 77
*Everlasting Valve Co. 67
*Fairbanks, Morse & Co. 39
Ft. Worth Laboratories 76
Goode Equipment Co. 73
*H. P. Gott Manufacturing Co. 66
*Grant Oil Tool Co. 65
*Gray Tool Co. 35
*The Guiberson Corp. 47
Gulf Engineering Co. 78
Hill & Hill Truck Line 78
Houston Laboratories 80
Houston Radio Supply Co. 78
*Hughes Tool Co. IV Cover
*International Harvester Co. 56
The International Nickel Co. 36
*Jones & Laughlin Steel Corp. 6
*The Thomas Laughlin Co. 68
*LeRoi Co. 69
Lykes Bros. Steamship Co. 71
Missouri-Kansas-Texas Railroad System 67
Murphy Diesel Co. 48
*The National Supply Co. 52-53
*Nordstrom Valve Division, Rockwell Manufacturing Co. I Cover
*W. C. Norris Manufacturer, Inc. 1
Norton Equipment Co. 79
Oilfield Machine & Supply Co. 64
Orange Roller Bearing Co. 43
Owen Tool Co. 76
Pacific Wire Rope Co. Insert Opp. 32
*Patterson-Ballagh Corp. 4 and 76
*Pelican Well Tool & Supply Co. 62
*Penberthy Injector Co. 42
*J. P. Ratigan 59
Victaulic Company of America 2
*Visco Products Co. 40
War Assets Administration 3 and Insert Opp. 33
*Waukesha Motor Co. 63
The Weld Inspection Laboratory 80
David White Co. 70
The Youngstown Sheet & Tube Co. 27

International Section

(Insert 48-49)

*Baker Oil Tools, Inc. 18-19
*Baroid Sales Division, National Lead Co. 49
*S. R. Bowen Co. 41
The Continental Supply Co. 14
*Fluid Packed Pump Co. 2
*Franks Mfg. Corp. 9
*Gaso Pump & Burner Manufacturing Co. 46
*Globe Oil Tools Co. 33
*Hunt Tool Co. 25
*Hydril Co. 38
Independent Exploration Co. 6
*Lane-Wells Company 45
*Larkin Packer Co. 13
Lone Star Cement Corp. 34
*Lucey Export Corp. 10
*Jas. P. Marsh Corp. 26
*Mission Manufacturing Co. 5
*National Lead Co. 49
North American Geophysical Co. 21
*Oil Center Tool Co. 30-31
*Rector Well Equipment Co. 50
*Reed Roller Bit Co. Insert 42-43
**Schlumberger "Surenco" 29
*Stewart & Stevenson Services 37
*Wilson Manufacturing Co. 17

An A.A.P.G. Publication!

TECTONIC MAP of the UNITED STATES 1944

Prepared under the Direction of the Committee on Tectonics, Division of Geology and Geography, National Research Council.

Chester R. Longwell, Chairman, Philip B. King, Vice-Chairman.

Charles H. Behre, Walter H. Bucher, Eugene Callaghan, D. F. Hewett, G. Marshall Kay, Eleanora B. Knopf, A. I. Levorsen, T. S. Lovering, George R. Mansfield, Watson H. Monroe, J. T. Pardee, Ralph D. Reed, George W. Stose, W. T. Thom, Jr., A. C. Waters, Eldred D. Wilson, A. O. Woodford.

A NEW GEOLOGIC MAP OF THE UNITED STATES AND ADJACENT PARTS OF CANADA AND MEXICO

Geologic structure, as evidenced and interpreted by a combination of outcropping areas, bedrock, surface disturbance, and subsurface deformation, is indicated by colors, symbols, contours, and descriptive explanation. Igneous, metamorphic, and selected areas of sedimentary rock are mapped. Salt domes, crypto - Volcanic disturbances, and submarine contours are shown. The base map shows state boundaries, rivers, a pattern of cities, and 1-degree lines of latitude and longitude.

The scale is 1:2,500,000, or 1 inch equals 40 miles. Printed in 7 colors on 2 sheets, each about 40 x 50 inches. Full map size is about 80 x 50 inches.

PRICE POSTPAID

$2.00 rolled in mailing tube
$1.75 folded in manila envelope
$1.50 in lots of 25, or more, rolled or folded

The American Association of Petroleum Geologists

Box 979, Tulsa 1, Oklahoma, U.S.A.